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An Investigation into the Development of Symbolic Play in Children with Autism

by

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Abstract

Impairments in the use of varied, spontaneous, symbolic or imaginative play or the absence of developmentally appropriate social imitative play is of diagnostic significance in autism (Diagnostic and Statistical Manual of mental disorders, 4th edition [DSM IV] 1994). Many studies have found a poverty in play generally and particularly in spontaneous symbolic play amongst children with autism. It is then remarkable that some research studies have found that in structured settings such children are able to understand pretence and produce acts of pretence.

Study 1 was a small scale study of 6 children with autism in a school setting and found that some were able to learn to play symbolically following a 4-month intervention. Structure and affective engagement emerged as 2 factors possibly mediating this improvement. Study 2 contrasted Structure and Affect each in combination with Repetition in a quasi-experimental design with 12 (different) children. Study 3, using a similar method to Study 2, additionally considered two further variables: interest in the materials and the identity of the researcher. The study showed that symbolic play acts could be elicited in the participants using high structure and high affect conditions. The use of high interest toys was less likely to elicit symbolic acts in these participants. The number of symbolic acts used by the participants were not unduly influenced by the replication of the conditions by a second researcher. A factor that possibly mediated the effects seen in Study 3 was the social-communicative responses of the participants and so Study 4 studied children with learning difficulties, four who had autism and 4 who did not, matched on verbal comprehension and examined the level of social communication responses in relation

to symbolic play during three conditions of high affect, high structure and low intervention. Implications for education and further research are discussed. Results of all studies were not definitive.

This represents a preliminary study to identify factors that may be effective in the teaching of symbolic play to children with autism. Some initial success with individual children indicates structure and affective engagement as factors that need to be investigated in future research.

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Sherratt, D. (2002) 'Developing Pretend Play in Children with Autism: a case study', *Autism : the International Journal of Research and Practice*, 6 (2) 169-181. This study has also provided a basis for several other publications and conference papers. I would like to thank Tania Chambers, the publishers and the editorial team of *Autism : the International Journal of Research and Practice* for allowing me advanced access to papers from the special edition in play.

Finally I would like to thank my family and friends for their support. This thesis is dedicated to the memory of the late T.D. Sherratt who started this journey with me but didn't make it to the end.

Introduction

A Personal Statement : the story of the journey

My interest in the pretend play of children with autism started with the observation that some of the children in a special school unit in which I taught many years ago, showed signs of pleasure in functional play whilst I was playing with them but did not show any interest in the materials or in play if they were not working with an adult. In the early 1990s there was little written about the play of children with autism and this was generally supportive of children with autism having an impairment in play and in particular symbolic play.

Children with autism have often been thought to have impairments in their development of pretend play. In particular the occurrence of symbolic play in children with autism has been notable either by its absence or by its unusual qualities (Leslie 1987).

Lewis and Boucher (1988) suggested that providing a particular setting might enable children with autism to demonstrate the ability to symbolise through play acts inspired me to further explore the ideas of structured play with the young LFA children that I taught. The publication of some further papers on structured play in children with autism in the mid-nineties and a position in a new school persuaded me to investigate the symbolic play of children with autism more formally. Professor Jill Boucher agreed to become my tutor, whilst she was at the University of Sheffield. After one year, I transferred to the University of Warwick in order to maintain her tutorage.

Over the intervening years I have worked as a classroom teacher with additional responsibilities for early years children, autism, pupil progress and inclusion. I have also worked as an advanced skills teacher in autism which involved training and advice to other schools across the education authority. I have worked as a regional tutor in autism at the University of Birmingham and have held responsibilities on the National Teacher Researcher Panel, worked on the National Forum on Educational Research and chaired a steering group on systematic reviews in education research for the Department for Education and Skills. I have written one book on autism, co-authored another and contributed a chapter to a third. I have authored one academic paper (which is based on Study 1), co-authored another and have spoken at conferences at home and abroad.

At school, I have worked closely with Gill Donald who has managed to sustain my excitement in autism, challenged my ideas, participated in Study 3 as a researcher, co-authored an academic paper. For all these reasons, I am indebted to her.

Study 1 was a pilot study to investigate the possibility that children with autism could be taught how to play symbolically in a structured setting. The results of this challenged my preconceptions about autism and following advice from my tutor on possible explanations, Study 2 was designed. This was an attempt at a quasi-experimental study. As the subjects were matched primarily by verbal comprehension, I was unaware until all the data was tabulated that the symbolic play test scores were significantly different between the comparison groups. The decision to include Study 2 in the thesis was due to the quality of the play by the children, which is of relevance

despite the methodological flaws. Although the results of Study 2 supported the findings of the earlier study, it was still unclear what the most important features of the play interventions were. Study 3 attempted to clarify these features by reducing the repetition and learning involved in the previous studies. Study 4 aimed to add detail about the social and communicative behaviours of children with autism when compared with matched developmentally delayed subjects. The journey through the studies, the research and the literature has been a personal quest. It has been a long journey and one that has revolutionised my understanding of autism. Along the path, I have exchanged views and information with others and this has made the journey all the more valuable.

What is autism ?

Autism is a developmental disorder that is defined by observed behaviours that show a pattern of social and communicative impairments and restricted and repetitive behaviours by 36 months of age. There are two internationally accepted classifications that provide diagnostic guidelines for autism. The International Classification of Diseases or ICD 10 (World Health Organisation 1993) and the Diagnostic and Statistical Manual or DSM IV (American Psychiatric Association 1994), both provide very similar criteria for the diagnosis and classification of autism or autistic disorder. Both of these guides make close reference to the triad of autistic impairments (Wing and Gould 1979), which form a core of impairments, the co-existence of which is critical for a diagnosis of autism. As the criteria for a diagnosis of autism are dimensional rather than clear-cut categories, the result is a continuum that has blurred the boundaries of autism at least in the popular and educational uses of the term (Berney 2000). The use of broader term, “autistic spectrum disorder” by

Wing (1996) which included classifications similar to autism including pervasive developmental disorder - not otherwise specified (PDD-NOS), has broadened the population of people who would not meet the specific criteria for a diagnosis of autism or autistic disorder. However seeing this clinical group as part of a spectrum of associated conditions has increased the heterogeneity of the autism group. There have also been arguments made for the similarities and differences of those relatively able people who have autism and those with a similar or related conditions, Asperger Syndrome or PDD-NOS (APA 1994). Dissanayake and Prescott (in press) in a comparative study of pretend play in children with high functioning autism and Asperger's Disorder found that children were not differentiated on any play category. This suggests that impairments in play were variants on a single autism spectrum. The behaviours, academic achievements and language developments of the autistic population are so varied that individuals are sometimes included in sub-groups of low functioning autism (LFA) and high functioning autism (HFA). In this way, a more meaningful analysis of play behaviour and impairments in play can be undertaken.

The use of the LFA category is not always applied consistently but has been used to create sub-groups within the broader Autistic Disorder (DSM IV) diagnostic classification. Tuchman and Rapin (1997) considered children with autism to be high functioning if they exhibited age-appropriate or near age-appropriate cognitive skills. They were low functioning if they had few or inconsistent age-appropriate skills. The HFA group often applies to people with autism who have an IQ above 70, are verbal and have good daily living skills. The use of IQ or developmental levels have also been used by other researchers in defining more precisely the LFA category.

McGovern and Sigman (2005) found that high-functioning adolescents with autism showed more improvement in social interactions, repetitive/stereotyped behaviors, adaptive behaviors, and emotional responsiveness to others' distress than low-functioning adolescents with autism, when compared with functioning in middle childhood. The participants were grouped into high and low functioning groups (IQ > 70) and low (IQ/DQ < 70). The HFA group showed larger reductions in reported social impairments than the LFA group, better progress in verbal communication and more substantial reductions in repetitive behaviors and stereotyped interests. Only nonverbal communication scores showed no significant difference between the groups.

Leekham, Lopez and Moore (2000) divided their autism group into two by Non-verbal mental age (MA) and Intelligence (IQ). Their LFA group were aged between 2:10 and 5:10. The mean IQ score for this group was below 70. MA was below 2:6. Leekham, Lopez and Moore found that gaze following was significantly impaired in the LFA group compared with both developmentally delayed matched subjects and a HFA group.

Gabriels, Hill, Pierce, Rogers and Wehner (2001) studied 15 children with autism (and 2 with PDD-NOS) who received generic treatment over a mean period of 37 months. They found different developmental trajectories among the participants separated them into high or low outcome groups. The developmental intelligence levels between the two groups were significant in predicting their outcome. On the first measure at mean age of 31 months, the LFA mean language and cognitive developmental quotients were 38 and 47 respectively. In contrast, the HFA mean

language and cognitive developmental quotients were 47 and 69 respectively. Although early language scores were not predictive of later outcomes, early developmental IQ was predictive of all outcome measures including language, academic achievement and adaptive functioning. Furthermore the developmental trajectories of the two groups were distinct as both cognitive and linguistic quotients increased for the HFA group and decreased for the LFA group. These studies support the notion that the use of LFA as a category has some validity.

In a comparison of the verbal intelligence (VIQ) and performance intelligence (NVIQ) scores of people with autism, Lincoln, Allen and Kilman (1995) found that VIQ was substantially lower than NVIQ in most studies. In particular a discrepancy was found between the verbal comprehension test and the block design test.

Although NVIQ exceeds VIQ in children with LFA, less discrepancy is found in many children with HFA. (Szatmari et al. 1990, cited in Lincoln, Allen and Kilman 1995). Similar results in a study of 164 children with autism (age range 3 - 15 years; IQ range 14 - 143) were found by Mayes and Calhoun (2003). Interestingly, Mayes and Calhoun also found that age and full IQ were positively correlated and in addition, that the discrepancy between VIQ and NVIQ decreased in HFA and LFA groups at different rates. In the LFA group, a VIQ / NVIQ discrepancy of 15 points that had remained stable below school age, decreased during school years. By the age of 10, the gap had closed and there was no significant difference between VIQ and NVIQ.

Twelve studies were examined by Lincoln, Allen and Kilman (1995) in which VIQ and NVIQ of children with autism were compared. In four of the studies, children had mean ages ranging between seven and ten years. In these studies, the VIQ scores were

substantially lower than NVIQ scores. In studies that assessed older people, much less disparity was found. This (on face value) supports the findings of Mayes and Calhoun (2003).

The subjects in Studies 1-4 in this thesis were assessed and/or matched using verbal comprehension scores and not IQ. All the participants in these studies had verbal comprehension scores that were lower than their chronological age (CA). All the children in the studies had severe to moderate learning difficulties. These were defined in relation to developmental progress relative to their chronological age. The participants in Studies 1 - 3 were children with autism and learning difficulties. In Study 4, a group of children with autism was compared with a group of children who had learning difficulties but did not have autism. These children were chosen from the same schools as the children with autism. The participants were matched on verbal comprehension and were in the primary educational phase.

All the children with autism in these studies went to one of four special schools and were in special classes or units within these schools. In this education authority, the placement of children in such units generally means that they had substantially greater educational needs than their developmentally delayed peers. Many of these children would have been considered to have severe learning difficulties. The children all had some language use. Although all participants had a receptive language level of at least 20 months, some subjects only functioned at a single-word requesting level. All the participants had a diagnosis of autism. These were either made by local multi-disciplinary teams or from diagnostic services with a national reputation.

All the participants with autism might be considered to have Low Functioning Autism (LFA) and would not be thought of as having High Functioning Autism (HFA) or Asperger Syndrome. One participant in Study 2 might be considered to have borderline LFA due to his higher language level. However as his age was above seven years there might be expected a smaller discrepancy between VIQ and NVIQ (Mayes and Calhoun, 2003).

What is pretend play ?

Stone and Yoder (2001) found that object play was not a significant predictor of expressive language development. Although it was correlated with language scores at 4 years, the correlations became non-significant when earlier language was controlled. From a Piagetian perspective (Fein 1981), symbolic play can be seen as developing cognitive processes of decentration, decontextualisation and integration. Decentration involves the separation of recognising oneself as an agent within play, to seeing others as responsible for play actions. Decontextualisation involves identifying non-representational objects as symbols for the real object within play. Integration involves sequencing together acts of pretence into continuous play. For Vygotsky (1967) cited in Nichols and Stich (2000), play provides a process that is effective in developing intentionality by accrediting action with meaning.

In designing a play training programme, de Moor, van Waesberghe and Oud (1994) compiled a list of behaviours that showed a hypothesised sequence of play categories (Figure 1:1). These categories were based on previous studies including Belsky and

Most (1981). Play behaviour was grouped into three sections, Exploration, Functional-Relational and Pretend Play.

Exploration (categories 1-5)

(1) Mouthing: indiscriminate mouthing of materials (e.g., the child grasps an object, brings it to his mouth, then licks, mouths or chews it)

(2) Visual examination: the child inspects the object by turning it round in his hand and looking carefully at it

(3) Simple manipulation: exploring objects by indiscriminate manipulation (e.g., holding and shaking object or banging it against a surface)

(4) Specific manipulation: exploring the function and possibilities of the object (e.g., spinning wheels of a toy car)

(5) Relational manipulation: bringing together two or more materials in an inappropriate way, that is, a manner not initially intended by the manufacturer (e.g., puts spoon in bath)

Functional-relational play (categories 6-8),

(6) Functional play: visually guided manipulation with an object that is used in a functionally appropriate way (e.g., rolls car, takes off clothes of doll)

(7) Relational play: bringing together and integrating two or more objects in an appropriate manner, that is, in a manner intended by the manufacturer (e.g., set cup on saucer)

(8) Sequential-relational play: a sequence of play behaviours inside a common framework (e.g., the child puts the pan on the stove, brings the pan to the table, empties pan onto plates and finally brings spoon to the mouth of the doll)

Pretend play (categories 9-13)

(9) Enactive naming: approximate pretence activity but without confirming evidence of actual pretence behaviour (e.g., touch cup to lip without making drinking sounds, tilting head back)

(10) Pretend self: pretence behaviour directed toward self in which pretence is apparent (e.g., drinks from cup, making drinking sounds)

(11) Pretend other: pretence behaviour directed away from child toward other (e.g., feed doll with spoon)

(12) Substitution: a. using a “meaningless” object in a creative or imaginative way (e.g., eating a block); b. using an object in a pretence act in a way that differs from how it was previously used by the child (e.g., use hairbrush to brush teeth after already using it as a hairbrush); c. without material: a pretence act with gesticulations and/or verbalizations (e.g., picks up doll from bath, pretends taking a towel and dry the dolls hair saying “drying, drying”)

(13) Double substitutions: pretence play in which two materials are transformed within a single act into something they are not in reality (e.g., eats pizza with knife while the bottle is the pizza and the handle of the pan the knife)

Non-play behaviour (category 0)

(0) Non-play behaviour: all behaviour with material not applicable to one of the 13 play categories (e.g., touching a toy, pointing at toy)

Figure 1:1 A Hypothesised Sequence of Play Categories.

Normal play development is often categorised as sensori-motor, relational, functional and symbolic (Libby, Powell, Messer and Jordan 1998). Pretend play can involve either symbolic or functional play. Functional play normally develops at the end of the child's first year and involves using objects in an appropriate or conventional way (Ungerer and Sigman 1981). A child who raises a spoon to Dolly's mouth would demonstrate functional play. This does not require the use of more complex secondary representations that are seen in later symbolic play. Leslie (1987) proposed three forms of pretence. Although these are not thought of as absolutely exclusive, they do provide a sufficient means of classifying play behaviour that is symbolic. Symbolic play involved, a) substituting one object for another; b) the attribution of false or absent properties or c) imagining that an object is present or absent. If the Dolly dropped an imaginary piece of hot pizza on her dress and complained that her legs were burned, the agent would have been involved in symbolic play. The first symbolic representation involved was the appearance of a non-existent food item. Within this study, the child would have had to signify the food item to have an imaginary existence, to be accredited with a symbolic act, e.g. 'Hmm pizza' or indicate its tastiness by nibbling its imaginary edge. The second symbolic representation attributes an emotional state to Dolly as she became upset by being burned. If Dolly had then picked up a small box or seashell and taken this to her mouth for a drink of water, the agent would have been involved in a further symbolic

function, that of substituting it for a cup. Within more advanced pretend play, such events are often combined and linked through a narrative (Sawyer 1997; Howes 1992). These categories have been used for further research and in the development of testing and observation procedures (Lewis and Boucher 1997; Whyte and Owens 1989; White 2002) Leslie's three categories are in some ways clearer and simpler than the symbolic acts on the elaborated list (figure 1:1) above. Leslie also included a category of the attribution of absent or false properties. This does not fit within the hypothesised sequence of play categories suggested by de Moor, van Waesberghe and Oud (1994). In addition, two of the Pretend Play categories (9 and 11) appear to be consistent with functional rather than symbolic play. The clarity of Leslie's categories depends on their adherence to their symbolic qualities. Thus any play behaviour must be interpreted in terms of its symbols, whereas de Moor, van Waesberghe and Oud (1994) rely on behavioural descriptions.

Although the first signs of pretence occur between twelve and eighteen months, children appear to understand pretence in others by 28 months (Harris & Kavanaugh, 1993). For example, they understand that if someone pretends to spill pretend tea, the location is "wet". Pretence requires the use of mental representations, but some researchers believe that the pretender must also be aware of them as a mentalistic object (Flavell and Miller, 1988; Leslie, 1988). Leslie (1987) postulated that symbolic representations such as those found in pretence are "marked off, or 'quarantined,' from the primary representations" (1987, p. 415).

Harris (1994) suggests that for a child to recognise an act of pretence in another, they must identify it as an equivalent to their own experience of pretending. However this is not achieved through metarepresentation but the simulation of the other child's

behaviour. Through this simulation process, the child is able to share an understanding of the other child's behaviour. However the child does not necessarily need to label this shared understanding or recognise it as a representation process. It is not until the fourth year that many children are able to reflect on such a proposition. Instead two year-olds can see that another person can act "as if" a non-existent event were true, but cannot recognise that someone else may or may not believe that this is the case and that it is their belief, that will guide their actions. Harris (1994) sees that in shared pretend play it is sufficient to share the pretend play scenario in the head of his partner. He does not need a representational understanding to do this. There is not a need to represent the thoughts of another, rather in young children the scenario is simulated and the children act within a context of pretence.

It is possible to extend this argument further if we can accept that a child of less than twenty-four months old need not form a behavioural or mentalistic representation of the pretence at all. Thus young children watching another child pretending to hop like a kangaroo may experience the desire to join in with the pretence without any understanding of kangaroos. The older child would then be seen as playing; displaying behaviours that are not highly goal-directed but do involve pleasure. In this case the older child would be jumping up and down and laughing. It is possible that toddlers act on this event (jumping and laughing) through imitation and do not necessarily form a representation of it as an act of pretence or as the older child behaving "as if she were a kangaroo" but rather represent it as simply an entertaining action that can be joined in with.

Stern (1985) found that from 18 –24 months, children may be capable of representing themselves using a doll or external object. This shows that children of this age can conceive of themselves as an objective entity. Although this does not though indicate that these young children are capable of metarepresentation, it does give some support to the argument that there is an unfolding of an ability to represent oneself and therefore be aware of ones role as an agent from an early age. It also shows one means of implicitly demonstrating this understanding through pretence. Lillard (1994) believes that three year-olds see pretence as being non-representational with an additional element. That the child whilst not construing of pretence as representational can recognise that another child can have a mental relation to pretence and that this is the additional element. If the child can construe the actions of another as that of an agent then this must be seen as engaging in a mental relation. It may also be true that this mental relation simply refers to the particular behaviours that are marked off as being of pretence.

Although Perner, Barker and Hutton (1994) would accept Lillard's findings, he would not credit that children could differentiate such pretence from belief. Lillard would contend that the child uses other mental relations to pretence such as knowing and thinking. The pretender must know something about the pretence and that the pretender must think about the pretence. It seems that Lillard and Perner are in some agreement on the main points of this argument. However, that young children have an awareness of their own actions or the behavioural manifestations of others, does not in itself further this argument. If children of three year-old were aware that in pretence, they were behaving in a way that was not of reality or of their belief system, then this might be an important stepping stone towards metarepresentation. It was shown above

that children of three years are capable of recognising the distinction between reality and pretence. It seems then that these children should be capable of recognising that another child can exert an intentional role towards an object that is based on the belief system but decoupled from it. Is this then an important stepping-stone to the development of metarepresentation ? Although it is tempting to suggest that this is so, it is possible that although three-year-old pretence has a structural form that is similar to that of false belief, yet omitting mentalistic content. It may be possible that although pretence could be important in the development of a Theory of Mind as postulated by Leslie (1987), it is not necessary for it. Pretence perhaps plays a role in the development of metarepresentation and in the development of hypothetical thought (Harris 2000).

The Research Question

The little literature on symbolic play development in children with autism was generally focused on older and more linguistically able children than I was teaching. The question of whether it was possible for children with LFA to play symbolically arose. Theoretically this seemed possible, yet no studies at that time described teaching young, less able children to play symbolically. Would it be possible to create an environment in which these young, LFA children could play ? If so, which conditions would be responsible for enabling play ? No other study had considered this question. There are other research projects that have investigated play in children with autism. These have either studied different populations or used different methodologies. Details of these are given in Chapter 2.

In Study 1, the question was, can children with autism demonstrate symbolic play acts in or following a structured play intervention ? Study 2 investigated this further and asked whether structure or affect was more effective in developing symbolic play in children with autism during a 16 week intervention ? Study 3 involved children with autism as participants that attended schools other than the author's. Using short, 3 minute conditions, it investigated whether children with autism displayed more symbolic play under structured conditions or whether affect or the subject's preference for a particular toy (additional to those used in the other conditions) would increase this aspect of their play. Study 4 extended this, by exploring which socio-communicative behaviours participants displayed under the structure and affect conditions. These were compared with children who were matched for receptive language, but had learning difficulties and did not have autism. The research questions are important to both researchers and practitioners. Although the research in this thesis has taken place over many years and a time when the subject of play has become increasingly studied, the research questions still have a validity to researchers and to practitioners.

Practitioner Research

Practitioner research gives a central role to the practitioner in research design, as participant in directing or observing participant behaviour, in collating, analysing and interpreting datum / data and in disseminating any findings to an appropriate audience. The particular research methods used are dictated by the research questions and the contribution that the practitioner can make to them.

In designing the research questions, the practitioner can contribute an insightful and sometimes intuitive understanding of the issues based on a close daily experience of practice, ready communication with a network of other interested parties including parents, professionals and paraprofessionals and the ability to try out ideas and explore the issues informally. The questions that are of interest to practitioners may also be distinctive. These sometimes involve the evaluation of a particular teaching approach or intervention but may sometimes ask about more fundamental questions from a particular practitioner perspective.

As a participant within an intervention and in collating, analysing and interpreting datum / data, the practitioner is able to use personal experience to modify the style of the intervention within the parameters of the research. Examples of this may include the knowledge that a particular child does not respond well to men who wear blue or women with their hair tied up, or perhaps fine judgements of vocal intonation and prosody at a particular moment in a transaction. In these ways, practitioner research can add particular value to some research questions.

Yet the inclusion of a practitioner as a researcher, who is known to the participants, can also have disadvantages. There is a possibility that the researcher as participant in a study may change the dynamics and the results of it. When the researcher is also known to the participants, this possibility may further increase. Furthermore difficulties in allowing subjective judgements to influence the study may increase in practitioner research.

It refers to the important role of the practitioner in bringing experience and subjectivity to the research. Although it is most closely associated with case studies and action research, it does not exclude any research methods that benefit from the addition a practitioner. This role is particularly valuable when the research contributes a richness of detail to complex issues of interpersonal behaviour. Practitioner research also has a role in research questions that investigate difficult questions in which the answer depends on the sensitivity of the researcher to the dynamics of behaviour investigated.

Investigating the question of whether young children with LFA can use symbolic play, when previous attempts had either not been successful or not specifically attempted would be an example of how practitioner research could play a role in contributing to a wider understanding of autism. Issues of practitioner research and methodology are discussed further in Chapter 3

A Review of the Literature on Pretend Play

in Children with Autism

This review of the literature begins with a consideration of the research methods used in five studies. These are important in defining the types of study that are relevant to this thesis and to the research literature in this area. These and additional studies are then examined to highlight issues about the comparability of studies, followed by the areas of symbolic, social and spontaneous play of children with autism. These areas are pertinent to this thesis and also form clusters in the literature, as they pertain to questions frequently asked by researchers interested in the pretend play of children with autism.

Thomas and Smith (2004)

This intervention study was developed in Lincolnshire and is largely based upon Beyer and Gammeltoft (2000), which used modelled play in imitation to teach play based narrative. The participants in this study were 3 children with autism, aged between 3:4 - 4:1. The intervention was short only using 10, 5 minute sessions in a two week period. 10 minute video clips of free-play were used for pre and post test observations. These were analysed using 15 second, time-interval samples. These were coded for duration (time spent in each play category), frequency (of each play act) and diversity (different play acts).

All participants showed improvement in play skills and social skills. Participant A showed increases in social play and play with a wider range of materials. Participant B. used high levels of functional play in the pre-intervention observation and included pretend play in the post intervention observation. Participant C increased time on functional play and time with materials. He also added novel additions to the taught play scripts.

Criticisms of the methodology of this study rest on the following features. It used a small sample size of 3 children and no control or comparison group. There was no pre-intervention period to measure maturational / developmental variance or a post intervention period to assess lasting effects of intervention and generalisation of play to other settings. No MA or VMA data was used and so it is difficult to replicate this study. Finally the intervention period was very short. Whilst this did yield positive results, a longer period would have allowed the participants time to develop using play and would have allowed comparisons with other longer studies more easily.

Thorp, Stahmer and Schreibman (1995)

This study used a single-subject, multiple-baseline, probe design across 3 subjects with autism. The small size of the sample makes it difficult to generalise to a wider population. The participants had a mean age of 92 months. They had a mean IQ score of 61 using the Stamford-Binet (4th edition). The participants had a mean expressive language level of 4:1 using the Expressive One Word Picture Vocabulary Test-Revised. Receptive language levels were assessed (Peabody Picture Vocabulary Test-Revised) but were not reported.

Scoring was done by video recording each participant before and after treatment and again for a 3-month follow up. At each probe, a 12 minute video time segment was recorded. During the first 4 minutes of these samples, the adult only responded to the subject's initiations. For the remaining 8 minutes the adult attempted to involve the subject in sociodramatic play. The video samples were analysed using continuous 30-second time intervals. Coding used criteria for sociodramatic play. These were recorded as a percentage of time using behaviours. The participants all made gains in all aspects of sociodramatic play. In particular, all participants increased their use of symbolic play. These were often maintained in the follow-up observations. It is not clear exactly how large these increases were as the author's present the results in graphical form.

This study only considered substitution and imaginative disappearance as symbolic play acts and not attribution of false properties. This is different from most studies of symbolic play. No explanation was given for this. There is some suggestion that one of the coding categories (use of ambiguous items) was difficult to assess as the interrater agreement range was 62 - 97%.

The researchers included the subject's mother, father and a therapist. There was some lack of equivalence between researchers. For example Dillon's scores with his father were low in all 3 probes. However the study also showed that the affects of the sociodramatic training was not due to single researcher.

Wolfberg and Schuler (1993)

This study evaluated the Integrated Play Groups intervention. The first author has written extensively on integrated play groups (IPG) and has a significant interest in it's success. The IPG model combines one or more children with autism with two or more typically developing peers who are considered to be expert players. The expert players are trained how to interact with the subject and how to encourage social and object play.

This study investigates the social and object based play of three subjects aged approximately eight years, who participated in separate integrated play groups. The study uses two intervention periods and codes video data for social and object based play at baseline, intervention I, and two probes following the intervention periods.

Wolfberg and Schuler used both qualitative and quantitative methodologies in a multiple probe design. The research period covered approximately seven months and approximately twenty-four, thirty-minute sessions. A validation procedure was provided using semi-structured interviews with a parent of each child. Pre and post samples were used to compare stereotyped verses diverse solitary play.

Wolfberg and Schuler designed an evaluation study to test the hypothesis that the participants would gain in the cognitive and social dimensions of play and that these gains were observable.

This study used three play groups. Each play group included 2 children with autism and 3 normally developing (non-disabled) peers. Only one of the children with

autism was used as a target for the research. The reasons for the selection of the target child in each group was not given. This opens the research to bias in the selection of the target subject. Furthermore, the selection of the six participants with autism in the play groups is not clear. Which criteria were used in their selection ? Would participants with more severe learning difficulties or more severe autism have been used in this study? There is little mention of the language levels of the participants, yet the relationship between play development and language levels has been thought to be significant (Lewis and Boucher 1988). No standardised tests were used to assess the language levels of the participants. Rather the language is described in simple terms, which are open to question. The following sentences are used to describe the three participants in this study.

“Jonah’s verbal repertoire included mainly immediate and delayed echolalic phrases.” ...

Craig’s verbal repertoire consisted of echolalic speech with a few spontaneous single-word and two-word phrases. ...

Gary had no verbal language but communicated through vocalisations and other informal means.” p.472

In the examples of Jonah and Craig, the reported use of echolalia did not give an accurate guide to the language capabilities or abilities of these children. The verbal comprehension of these children could have been masked by the use of echolalia and

their general behaviour, preventing an accurate assessment of their language levels. Moreover, the language of these children may have been under-developed due to poor linguistic interventions prior to this study. The use of particular educational interventions may also have suppressed the spontaneous and generative use of language. In addition, the family situation of the participants is not described. It may be that the participants had or did not have siblings of a suitable stage in play and language development. The omission of such information weakens a study that is based upon the direct intervention of other children as “expert players”.

Extensive use of video data was made by this study, though four assessment periods. It is not clear why different numbers of video samples were taken in these assessment periods. In the Baseline data collection, Jonah and Craig had six samples collected but Gary had 7. The Intervention I data collection used four samples, Probe I used three and Probe II used only two. The authors do not explain why these numbers of samples were required and why equal numbers of samples were not collected from each assessment period. In not providing equal opportunities to sample play behaviour, this study may have increased the probability of bias in the results.

The study is interested in the generalisability of the play interventions, yet does not assess the participants play after a period of rest following adult intervention. Instead, the video data was collected within two weeks of Intervention I and the Extended Intervention periods ending. The generalisability of this study could have been better tested by providing additional probes after several weeks additional time without adult intervention. Similarly, the validity of this study could have been increased by examining how the target children played with different children in a different setting

(possibly a classroom) and different materials. This would not only have tested the ability of the target children to generalise their skills and attitudes towards play but would have reduced an additional variable. In the integrated play group procedure; the expert players are encouraged to structure the social play of the target children. In using different expert players who would be unfamiliar with the target children, the reliance on structuring would be reduced and the abilities of the target children to play spontaneously tested.

The principal researcher also performed an assessment of each target child's individual play before the first intervention and at the end of the study using different criteria (Nicholich 1977). It is not clear why different criteria were used for these assessments. They were used to investigate whether there was any generalisation from the intervention to the use of materials in independent play.

The results of this study showed that the subjects made substantial gains in their play. In particular making gains in the production of functional play and decreases in stereotypical behaviours. However there was little evidence of symbolic play. As functional and symbolic play are grouped together, it is probable that the developments in functional play are masking the combined results. As the VMA levels are not reported, it is difficult to make comparisons with other studies.

A further attempt to investigate the generalisability of the interventions used semi-structured interviews with a parent and the teacher of each target child. These were conducted by the principal researcher. Such interviews are highly likely to incur significant bias. There is no evidence to suggest that either the parent or the teacher

was masked to the purposes of the research before they were interviewed. Given that the research was conducted in the school and that parents would presumably have given consent to it, it would suggest that not only were the parent and teacher not masked to the aims of the study but would be supportive of its aims. This may have made them inclined to see behaviours that they had not previously seen as significant or to see behaviours in a more positive light than previously. Rather than seeing sleeping with a doll as inconsequential, following the study, Jonah's parent may have seen it as a sign of early pretence. Gary's parent may have looked more closely at his behaviour with his older sister and attributed his behaviour to the interventions.

Reliability was strengthened by the use of interobserver reliability comparisons. This study used two observers who were independent to it. One of whom coded the data for all video samples and the other for 30% of samples. An average percentage agreement was used for all observation results. One problem in the coding of video data of play is the difficulty of making accurate observations of complex behaviour. This is made more difficult in children with autism who are largely non-verbal. Their intentions towards the materials and towards other people is not always made clear due to their communication difficulties. The use of social play criteria in the coding of play behaviour makes the task of the observer more difficult. As an example, the difference between social play categories - orientation and parallel/proximity play relies on judgements about the proximity of children in their play whilst they are both playing separately. The interobserver agreement ranged from 75 to 97%; this suggests that the coding distinctions are satisfactory but may be quite subtle and sometimes ambiguous.

The interobservers were also not masked to the aims of the study or to the order of samples (whether they were from the Baseline, Intervention I, Probe I or Probe II). This may have increased the bias of the observers.

This study did not examine the type of symbolic transformations used by the participants and were coded only for symbolic/pretend play. It is not clear that the participants used these symbolic acts symbolically or in imitation given the high level of modelling by the expert players and the propensity of some children with autism to imitate the behaviour of others without a symbolic understanding of it. The use of echolalia by two of the three participants provides an example of this type of imitative behaviour.

It is notable that the social play criteria for common focus in which the participants both focus of the materials at the same time decreased substantially in Probe I for all three target children, when compared with Intervention I. In Probe I adult attention was removed. Similarly the frequency of functional and symbolic play reduced when the adult structuring was removed in Probe I. As an Extended Intervention sample was not taken it is not possible to find whether this would have been repeated in Probe II.

The results from Probe II for Jonah and Craig were notable for functional/ symbolic play and for Craig in common focus and functional play. As only two samples were used for Probe II whereas six were used in the baseline samples, the results may be skewed by a small sample size. Jonah also shows a sharp decline in common focus in Probe II and this may be also due to the small sample size. However, this seems an

insufficient explanation and some qualitative description of the play of these participants would have supported the quantitative analysis and provided a clearer explanation of what was happening.

Craig makes remarkable progress in the Probe II sample for functional, symbolic and common focus in play. In the semi-structured interviews Craig's parent described him as asking,

“ to have L (female classmate come over to he house, he asks for E (male classmate) all the time ... and of course Craig has made his first friend and that's Tony. He loves Tony and Tony loves him.” P.482

Craig also was observed to be engaged in common focus approximately 35% of the time in week 8 and approximately 60% of the time he was using functional play in week 9 of the baseline sample. It may be that the reasons for Craig's success in Probe II were due to greater social and cognitive capabilities. Little useful information on the social and cognitive capabilities of the participants was provided in this report.

As the expert players were guided in their play with the subjects, it must have been difficult to rely on them as critical independent variables, as they have their own intentions, skills, aptitudes and attitudes. Details of what the expert players brought to the research and how they performed in it were not given in this study.

Wolfberg and Schuler suggest that their findings provide evidence of the social construction of cognition. They attribute this to the intervention and suggest that language may also be developed in this way.

This study provided detailed results using a large quantity of data. The coding of data was rich as it combined social and cognitive criteria. The interobserver ratings were given as an average percentage figure and as a range, which allowed a better understanding of the difficulties of coding complex behaviour. The quality of intervention was also assessed by three observers.

Charman and Baron-Cohen (1997)

Charman and Baron-Cohen attempted to find whether 22 subjects with autism were able to produce object substitutions and functional play under different structure conditions. This was compared with 19 subjects with mental handicap. These groups were matched for Chronological age (in months) and VMA.

Non-verbal mental age scores (NVMA) were also recorded for the participants. Charman and Baron-Cohen state that there is a statistically significant difference on the NVMA scores between the autism and mental handicap groups ($p < 0.001$). The autism group NVMA mean is almost double the mental handicap mean (90.3 - 45.5 months). However the other measures that were used for making comparisons although not perhaps statistically significant still incur a substantial difference. The autism group VMA mean was 46.6 months and therefore higher than the mental handicap group mean of 37.6 months. Given that the autism group chronological age means were 9 months younger, a possible advantage is given to the autism participants as they have higher NVMA and VMA at a younger age. This may have influenced the results. The autism subjects who produced a play act in response to an

open prompt had a lower CA than those who required prompting or made no response.

Charman and Baron-Cohen (1997) used either the British Picture Vocabulary Test (BPVS) or the Test for the Reception of Grammar (TROG). There are problems in the use of either BPVS and TROG in this way. Although both these tests assess an understanding of speech, the former tests the semantic understanding of single words and TROG measures a syntactical understanding of more complex speech. Although they are measuring different aspects of receptive language, Charman and Baron-Cohen have used the scores within a single category of VMA and combined them to find the mean, range and standard deviation.

The use of a test setting to examine pretend play may not be efficacious. Charman and Baron-Cohen use a procedure similar to Lewis and Boucher (1988) in which participants are asked to play with representational and non-representational materials under different conditions. Although children with autism have been shown to produce play acts in this type of setting and indeed have particular difficulty or show an absence of spontaneous symbolic play in naturalistic free-play settings, this does not mean that the formal setting is the optimal situation for play. Charman and Baron-Cohen found that only the autism subjects with a VMA of 4 years were able to produce simple object substitutions under prompted conditions. As the object substitution trials followed the functional play trials there is a possibility of carry over in the production of novel object substitutions. As autism subjects may be more likely to perseverate, this may have influenced the low novel object substitution play acts produced by the autism participants.

Bernard-Opitz, Ing and Kong (2004)

This study reported the results of a cross-over study that compared traditional behavioural approaches and natural play interventions. The participants had a mean chronological age of 39 months, range 28 - 44 months. The subjects were matched on chronological age and severity of autism and the functional play. Matching also questioned whether the participants' mothers were working and the parent's education level. The mean receptive language level was 15 months, range 5 to 24 months. The mean cognitive level was 22 months, range 6 - 35 months. (Cognitive assessments were taken three months after the beginning of the study due to logistical problems). One participant did not reach the cut-off for the autism assessment, but was included anyway. Two other potential subjects were excluded during the selection, but no reason was given. These issues cause concern to the validity of the autism group and the reliability of the group as the selection procedures were partially obscured.

Participants were sorted into two groups of four. One group took part in a behavioural training intervention over five weeks. The other group were exposed to a play-based intervention. Following the first intervention the children swapped onto the other condition, so that all participants had been exposed to and tested on both conditions.

The play-based group participated in a condition that involved the natural use of language and the use of social praise. Given the deviant language acquisition of many children with autism (Prizant, Wetherby and Rydell 2000 p. 203) and the difficulties in accepting social praise, these were unusual variables to include within the condition. This study was not intended to be research on play, but rather research that involved play. However, using functional play as a dependent variable with a naturalistic play

condition that was not designed for children with autism, weakens the validity of the study.

Increased familiarity with the materials may have biased the results of the test for functional assessment. This and the autism observation assessment PL-ADOS (cited in Bernard-Opitz et al, 2004) were used on four occasions in ten weeks. This may have threatened the validity of these tests.

The cross-over design is an effective compromise and well suited to this type of research. Although it loses some reliability in not using a control group, the effects of the interventions are partially controlled by each other. Reliability was also increased by the use of an independent rater in coding of the video samples.

The validity of the procedures was strengthened by selecting subjects with no formal educational or therapeutic experience. This was partly a function of the age of the participants but was advantageous in eliminating a possible confounding variable.

There was some disparity between the experience and training given to research assistants in each condition. The behavioural team leader had two years teaching experience with children with autism and the other research assistants were given 30 hours of behavioural training. The play-based team leader had only six months experience of working with children with autism and the other research assistants were given only five hours of training, some of which involved role play. The

inequalities in this experience and training pose a threat to the validity of the conditions.

The research methods used in investigations into the pretend play of children with autism described above are varied and range from Wolfberg's (1999) longitudinal study to the quasi-experimental studies, such as Charman and Baron-Cohen (1997). These studies do have a validity with regard to whether they adequately assess the research questions. The research methods were chosen to meet the demands of the research questions. Similarly each study, although very different from each other, achieves a level of reliability in very different ways. The procedures reported by Wolfberg (1999), Bernard-Opitz et al (2004) and Wolfberg and Schuler (1993) would be impossible to replicate exactly due to their complexity and their reliance on intersubjective responses. Yet this type of study generally increases its reliability by providing considerable detail on the procedure. In contrast, the relatively transparent, straightforward and logical procedures involved with quasi-experimental studies inevitably lend themselves to high reliability and replicability. It is not possible to identify a particular method as the most appropriate for studying pretend play in children with autism. Each method has strengths and weaknesses in terms of their reliability and validity. Each method provides a different perspective; it answers similar questions in different ways.

Are studies directly comparable ?

Some studies examine the variables involved in the play of children with autism and in so doing, sometimes facilitate play behaviours. Many of these are not attempting to teach play but to measure it under a variety of influences. Other studies evaluate a

play intervention used with children who have autism. This section of the Literature Review examines the results of such studies and also considers the methodologies employed by them.

Which research methods did the studies use ?

Some studies attempted to evaluate a play intervention. Schlein and Rynders (1990) used a multi-element design with 17 subjects who had autism. This study to investigate the effect of social groups on the play of subjects with autism, used observation probes in each of 4 social conditions. Thorp, Stahmer and Schreibman (1995) evaluated an intervention for 3 subjects with autism. They used sociodramatic play training programme. This was assessed using an analysis of 12 minute video time segments using continuous 30-second time intervals. The coding used criteria specific to sociodramatic play. These were recorded as a percentage of time using sociodramatic behaviours. Yang, Wolfberg, Wu and Hwu (2003) created integrated play groups for two children who had autism. They met twice weekly for 40 to 60 minutes sessions over a period of approximately 6 months (35 sessions). Thomas and Smith (2004) uses modelled play in imitation to teach play based narrative to 3 children with autism. They used 10, brief sessions in a two week period. Wolfberg and Schuler (1993) evaluated the play skills of 3 children with autism in integrated play groups. The research period covered approximately seven months and approximately twenty-four, thirty-minute sessions.

These studies frequently use small groups of participants. They use observational techniques to assess progress and the increased use of video has made detailed micro-

analysis possible. Additionally these studies enhance any numerical results with illustrations of play and rich descriptions of the setting and procedures.

Other studies attempted to examine the symbolic play of the participants under different or specific conditions. These include Kok, Kong and Bernard-Opitz (2002) who used a multiple baseline design across subjects to compare two interventions with 8 subjects who had autism. 4 children had high functioning autism (age appropriate non-verbal intelligence and more than 50 words vocabulary) and the others had low functioning autism. Libby et al (1998) examined the play of 9 subjects with autism. As this study investigated spontaneous play, the participants were observed without a play intervention or direct prompts. They used time interval analysis to code for types of play. 60 intervals of 15 seconds were analysed for each child. Lewis and Boucher (1995) assessed original or repeated ideas and the ability to follow instructions in 15 subjects with autism. Jarrold, Boucher and Smith (1994) investigated whether 24 children with autism could over-ride the functionality of objects and accord them with an alternative function. Jarrold, Boucher and Smith (1996) assessed the spontaneous and elicited play of 14 children with autism. They then tested the children's ability to perform play acts following an instruction. Finally, 15 subjects were tested to find if they could generate play acts as effectively as language-matched, normally-developing and learning-disordered comparison groups.

Several studies have attempted to investigate the play of children with autism without using control or comparison groups (Schlein and Rynders 1990; Neeley, Neeley, Justen and Sumner 2001; Thorp, Stahmer and Schreibman 1995; Yang, Wolfberg, Wu

and Hwu 2003; Thomas and Smith 2004; Wolfberg and Schuler 1993). These studies have particular methodological difficulties, which are discussed below.

Some studies have used control or comparison groups that are matched for verbal mental age (VMA). These include Baron-Cohen (1987), Riguette, Taylor, Benaroya and Klein (1981) and Lewis and Boucher (1988). However there are still problems in matching subjects in these studies due to different interpretations of VMA. Some studies (Jarrold, Boucher and Smith 1994) match subjects by their expressive language test results whilst others use verbal comprehension scores (Jarrold, Boucher and Smith 1996; Charman and Baron-Cohen 1997). Charman and Baron-Cohen (1997) used either the British Picture Vocabulary Test (BPVS) or the Test for the Reception of Grammar (TROG).

Some studies used both receptive and expressive language scores (Neeley, Neeley, Justen, and Sumner, 2001; Libby et al 1998; Thorp, Stahmer and Schreibman 1995; Lewis and Boucher 1995; Jarrold, Boucher and Smith 1994) and some studies did not use VMA for matching or to describe the participants by measuring this (Wolfberg and Schuler 1993; Schlein and Rynders 1990). Some studies used a simple assessment of verbal comprehension such as the British Picture Vocabulary Scales (Baron-Cohen 1987). Yet children with autism may be able to score more highly on these naming tests than their overall understanding of language would otherwise suggest. There are also difficulties in using psychometric tests which have been standardised on different populations and which may not therefore have comparable norms. Furthermore some tests may be more suited to the task than others? Should studies that attempt to examine spontaneous play use expressive language tests and studies that attempt to

examine structured, elicited and prompted play use verbal comprehension scores to compare subjects ?

Some studies did not report MA or VMA of participants (Schlein and Rynders 1990; Yang, Wolfberg, Wu and Hwu 2003; Thomas and Smith 2004; Wolfberg and Schuler 1993). Other studies either reported the MA or used it to match individual participants or groups (Kok, Kong and Bernard-Opitz (2002); van Berckelaer-Onnes 1994; Neeley, Neeley, Justen and Sumner 2001; Thorp, Stahmer and Schreibman 1995). Charman and Baron-Cohen (1997) used either the Raven's Coloured Progressive Matrices or the Merrill-Palmer Scale of Mental Abilities to measure the non-verbal mental age of participants. The latter being used on participants who were not able to reach the floor level of the former.

The chronological age of subjects also varied in different studies. Several studies used older children (Thorp, Stahmer and Schreibman 1995; Lewis and Boucher 1995; Wolfberg and Schuler 1993) whilst a few used children aged below seven years (Kok et al 2002; Neeley, Neeley, Justen and Sumner 2001 ; Thomas and Smith 2004 and van Berckelaer-Onnes 1994). Schlein and Rynders (1990) used children with a range from 5 - 12 years. Jarrold, Boucher and Smith (1994) used participants with the age range from 4:10 - 12:10 (mean 8:11). However Libby et al (1998) used participants with a range from 5:01 - 16:05 (mean 10:03). Charman and Baron-Cohen (1997) used subjects with a chronological age range from 5:3 to 18:0. It is difficult to establish what affect the large ranges of chronological age had on the results of these studies.

There was also a great difference in the method used for measuring symbolic play in the participants. Neeley, Neeley, Justen, and Sumner (2001) did not distinguish between functional and symbolic play, referring to both as pretence. Unusually, this study used the term “functional play” to refer to a range of physical behaviours that involve repetitive muscle movements, rather than the use of representational objects in ways appropriate to their normal use, e.g. using a toy car as if it were a real car. The study used a coding called the Parten - Piaget Scale on free play. Libby et al (1998) used their own scheme for assessing symbolic play, which was based on Leslie’s (1987) definitions for symbolic play and included criteria for functional play, non-play and early forms of play. Thorp, Stahmer and Schreibman (1995) used criteria specific to sociodramatic play. Lewis and Boucher (1995) coded for original / repeated ideas and an ability to follow instructions. In the study by Thomas and Smith (2004) behaviours were coded for duration (time spent in each play category), frequency (of each play act) and diversity (different play acts). Wolfberg and Schuler (1993) did not examine the type of symbolic transformations used by the participants and were coded only for symbolic/pretend play using criteria from Nicholich (1977). Wolfberg (1999) did not describe clear distinctions between types of symbolic play and between functional and symbolic play. Wolfberg describes functional play as having a focus on directing acts to objects and simple pretend play as a “*focus on directing acts to self, others and dolls using realistic props*” p. 152. Wolfberg used the term, “*Advanced pretend*” p.152 to mean an act that involves symbolic transformations. Although this is not clear in it’s distinction , it is this category that others might consider early symbolic play (Leslie 1987). Wolfberg describes one of the subjects, Freddy as using advanced pretend when he made a playdough burrito and said “Hmm” as he pretended to eat it. This is consistent with Leslie’s categories of object

substitution and attribution of false properties. Charman and Baron-Cohen (1997) coded only for object substitution in their symbolic play acts trials.

Some studies assessed the production of symbolic play in structured settings and some in unstructured free-play. Again these distinctions are too crude, as the degree of structuring varied both in these groups. Lewis and Boucher (1995;1988) and Charman and Baron-Cohen (1997) used prompts to structure play acts in a table-top activity that was a testing situation rather than a natural play environment. Libby et al (1998) gave very little structure to the participants and in an attempt to measure spontaneous play, provided a setting in which unstructured free-play was possible. A little structuring did occur through the use of a defined play space (table top) and by redirecting the attention of the participants to the materials. There was also some structuring through the use of an initial warming up period in which the participants were given some materials and “*encouraged to play with them*” p. 490. Thorp, Stahmer and Schreibman (1995) assessed the play of participants in a setting that was structured by new toys being contingent upon the use of existing ones. Thomas and Smith (2004) used assessment in free-play but this was environmentally structured through the use of a table-top setting and was socially structured by imitation of the play acts. The participants in the study by Wolfberg and Schuler (1993) were assessed in a free-play setting that was structured by carefully trained peers. It is difficult to establish the level of structuring in these examples. This makes clear distinctions about spontaneity in play more difficult. Baron-Cohen (1990) questioned whether a play act could be considered to be truly spontaneous if it had been prompted or elicited. It could equally be questioned whether a play act could be considered spontaneous if the structuring was more naturalistic and subtle as in the cases of

Wolfberg and Schuler (1993), Thomas and Smith (2004) or Thorp, Stahmer and Schreibman (1995).

It is then difficult to make straightforward comparisons between studies that investigated pretend play in children with autism. Some studies aimed to evaluate play interventions and others attempted to assess pretend play. Some examined structured play and others were concerned with spontaneous play. Within these groups there were differences in the research methods used, the criteria used for matching groups and generalising to a wider population, the chronological age of the participants and assessments of pretend play used were not always comparable.

Do children with autism use symbolic play ?

The studies fall into two groups when their results are considered. These are the intervention studies and the quasi-experimental studies. The intervention and evaluation studies are described first. These generally have positive results in which the participants increase the frequency or quality of play acts. How each study measures this progress is often different from each other. There must also be an increased likelihood that the close relationship that the researcher or research assistants / teachers have to the procedure could bias the results. Additionally, the length of intervention periods assessed covers a wide range. Thomas and Smith (2004) used a total of 50 minutes over a two week period. Wolfberg and Schuler (1993) assessed their intervention over a 7 month period. Wolfberg (1999) collected data for more than 3 years on three subjects with autism in integrated playgroups. Positive results were reported by the following studies, Wolfberg (1999), Wolfberg and Schuler (1993), Thomas and Smith (2004), Thorp, Stahmer and Schreibman

(1995). Although there were still many positive indicators of play development, van Berckelaer-Onnes (1994) reported less symbolic play than most other intervention studies.

The second group include the quasi-experimental studies, which attempt to find data that describe the play behaviour of children with autism. The results from these studies vary dramatically. Studies that show high levels of symbolic play acts under particular conditions include Lewis and Boucher (1988; 1995), Charman and Baron-Cohen (1997) and Jarrold, Boucher and Smith (1994; 1996). Studies that showed low levels of symbolic play in children with autism often in unstructured settings included Libby et al (1998), Baron-Cohen (1987) and Ungerer and Sigman (1981).

Is structure evident in studies that report symbolic play acts in children with autism ?

Most children with autism do not develop spontaneous symbolic play, yet when prompted to play, those that have symbolic capacity in their language may begin to use symbolic acts with play materials (Lewis and Boucher 1988; Jarrold et al. 1993, 1996; Charman and Baron-Cohen 1997). For example, when asked ‘what can you do with these?’ certain children are able to put materials together as if they are something else, so that an empty cardboard box may become a garage for a toy car, or a bowl for dolly’s soup. In a prompted situation, the child does not have to generate the retrieval of this image and is led into producing it: the prompt triggers a switch to the imaginary world. Children with autism may then be enabled to understand and use pretence, which challenges the notion that children with autism are ‘not able to play’.

If such prompts and elicitations can enable children with autism to produce acts of pretence in clinical or experimental settings, can they be used in a more naturalistic environment ? Stahmer and Stahmer (1995) showed that it is possible to shape the emergence of pretend play in children with autism, through systematically rewarding desired symbolic play acts. For example, the direct reinforcement of desired symbolic play acts through associated play activities has proved effective in teaching children with autism to engage in make-believe, at a level comparable to their normally developing language matched peers. Thorp et al. (1995) similarly used this approach to teach more advanced sociodramatic play to children with autism, with the adult reinforcing the child's initiatives in the emerging narrative with relevant equipment associated with the development in the script. The children made progress both in their play, in some language and social skills. They also demonstrated key characteristics of sociodramatic play. These were role playing, object substitution, social interaction, verbal communication and persistence (maintaining a narrative from beginning to end, with at least four consecutive elements).

When are children with autism ready to use symbolic play ?

Some studies that have found little symbolic play in children with autism and this may be due to the developmental readiness of the children. Levels of symbolic play showed a high correlation with levels of language use and comprehension (Cicchetti, Beeghly and Weiss-Perry 1994; Lewis and Boucher 1988; Sigman 1998; Ungerer and Sigman 1981; Whyte and Owens 1989). Studies that have been successful in producing symbolic play in children with autism have used subjects with language levels above 24 months. Studies that have used participants with lower language levels than this or who have not measured the verbal comprehension of the subjects

may have not produced symbolic play for this reason. Kok et al (2002), Thomas and Smith (2004) and van Berckelaer-Onnes (1994) may all have had their results limited in this way.

In early play development, children with autism often prefer to explore objects using their proximal senses of touch, taste and smell (Libby et al 1998; Sigman and Ungerer 1984) This may appear like the sensori-motor or relational play of normally developing children in the first year of life. Repetitive movements and manipulations with objects are common and the visual inspection of objects sometimes looks odd, particularly where the child uses their peripheral vision or focuses on what for most children would be an irrelevant detail (Freeman, Ritvo, Yokota and Ritvo 1986).

There may be unusual behaviours exhibited by children with autism towards these sensory qualities (Bogdashina 2003; Hirstein et al 1999). This type of behaviour can be maintained in the play of children with autism (Jordan 2003) and in normally developing children (Bruce 1991), when they are capable of other cognitively higher forms of play including pretence. However this perseveration and repetitive quality to their play is more evident in children with autism (Lewis and Boucher 1988; Swettenham, Baron-Cohen, Charman, Cox, Baird, Drew, Rees and Wheelwright 1998). Several studies reported that the repetitive and solitary play of children with autism is reduced during the play intervention (Wolfberg and Schuler 1993; Yang et al 2003; Schleien and Rynders 1990).

Several studies with control groups matched for level of receptive language have found that children with autism show impaired spontaneous pretend play (Baron-Cohen, 1987; Jarrold et al., 1996; Riguet and Taylor, 1981; Libby et al., 1998).

Children with autism have been shown to have deviant play development. They do not play as spontaneously as language-matched controls (Baron-Cohen, 1987; Jarrold et al., 1996; Libby et al., 1998; Riguet et al., 1981) and do not produce as much symbolic play as controls (Jarrold et al., 1996; Riguet et al., 1981; Sigman & Ungerer, 1984). However, it was found that children with autism were not impaired in their ability to understand the pretence of others matched for receptive language. (Jarrold et al. 1994; Kavanaugh & Harris, 1994)

The role-play of children with autism is often stereotypical and tends not to involve attributing a mental state to inanimate objects (for example, 'my dolly is hungry'). When entering into role-play, a normally developing child follows and improvises upon the flexible narrative of another - often the words are not scripted and the child takes on some of the surface characteristics to signify that the role has been taken; these characteristics are incorporated into the child's own understanding of the world (Harris 2000). It follows, that the relative lack of role-play in children with autism may contribute to their later difficulty in understanding the minds of others.

Do children with autism use spontaneous play ?

Levels of spontaneous pretend play in children with autism are significantly lower than prompted play (Lewis and Boucher 1988; Jarrold et al 1996; Charman and Baron-Cohen 1997). In asking a question at the appropriate time to children with autism, researchers have found that the children were able to produce novel acts of symbolic play. This play was comparable to that of control groups matched for verbal mental age. This suggests that individuals with autism can produce something that

looks like pretend play under certain circumstances, but have difficulty in the fluent, flexible and creative production of pretend play.

Some studies have reported that children with autism have used spontaneous symbolic play (Wolfberg 1999; Jarrold et al 1996). Others reported a poverty in spontaneous symbolic play (Libby et al., 1998; Lewis and Boucher 1988; van Berckeleer-Onnes 1994). Under what conditions were the children with autism unable to produce spontaneous symbolic play ?

What explanations are suggested for an impairment in spontaneous symbolic play ?

Children with autism may experience an overwhelming tendency towards repetition in their actions and thought processes. They are impaired in the fluency with which they can spontaneously produce a range of responses from a single stimulus (Turner 1997, 1999; Jarrold et al 1996). It is not clear whether children with autism lack this flexibility due to difficulties in the generation, or inhibition or monitoring of their thoughts and actions.

Harris and Levers (2000) suggest that play in children with autism is restricted because the children are impaired in the generation or execution of internal plans or narratives. Harris (1994) suggests that for a child to recognise an act of pretence in another, they must identify it as an equivalent to their own experience of pretending. However this is not achieved through metarepresentation (a representation of the representational process) but the simulation of the other child's behaviour. Through this simulation process, the child is able to share an understanding of the other child's

behaviour. Children with autism who produce acts of symbolic play in structured settings may be scaffolded into pretence but may lack spontaneity, motivation and have difficulty in generalisation (Harris 2000).

Is it possible that children with autism are impaired in their play due to difficulties in shifting their attention to different ways of perceiving and conceptualising ? Do children with autism have executive function difficulties that would dispose them to have problems with using objects that had a clear function such as using a pencil in a different way, e.g. pretending it was a toothbrush. Jarrold, Boucher, and Smith (1994) explicitly tested this suggestion, by examining whether individuals with autism were particularly reluctant to employ objects in pretence that had a clearly defined function, as opposed to more abstract 'non-functional' props. No such problems were observed.

Jarrold et al. (1996) explain the lack of spontaneity in the symbolic play of children with autism as the result of impairment in “*generating the retrieval strategies necessary for bringing pretend schemas into use*” p 227. In other words, although children with autism are capable of symbolising in pretence, they have difficulty in generating the necessary mental processes to use the imaginative object. It is not surprising that children who have difficulties in switching between rational and free-flow modes of thought would have difficulty in spontaneously using pretence.

What type of conditions are used in studies that report spontaneous symbolic play acts in children with autism ?

Lewis and Boucher (1995) examined individuals' ability to produce different pretend acts with the same, single prop. They found that children with autism produced fewer

novel pretend acts than controls in one condition (pretend uses of a car), but not another (pretend uses of a doll). Jarrold et al. (1996, Experiment 3) found that when asked to produce novel play acts with a range of objects, individuals with autism were able to produce pretend actions, but at a slower rate than controls.

However, the elicitation of such responses in children with autism is a long way from the absorbing spontaneous play that is frequently seen in normally developing children. Libby et al. (1998) found that the symbolic play acts of children with autism were limited almost entirely to object substitutions (one object standing for another).

Wolfberg (1999) stated, “*In all cases, the children spontaneously generated more diverse and complex forms of play than previously exhibited in independent play activity.*” p.152. This is in accord with the findings of Jarrold et al (1996) that children with autism are capable of producing novel play acts. However some statements about the play of the children in the study give reason to question the validity of the reported progress in spontaneous play. In which ways could the three participants (Jarred, Freddy and Teresa) in Wolfberg’s study be considered to have used spontaneous play?

“ In joint action, Jared learned to play in a functionally appropriate manner using constructive toys and realistic replicas, only occasionally directing isolated simple pretend play acts to himself, dolls and others. These generally reflected immediate or delayed imitation of a peer’s actions (e.g. saying “Hello” on the telephone, patting the baby doll, and saying “Baby”). Nevertheless, Jared appeared to be highly dependent on physical objects and

actions within the play group context in order to generate anything novel in his play repertoire. He was clearly locked into a literal mode, not yet able to understand the meaning of his new play combinations". p. 153.

Wolfberg's use of the term "simple pretend play" would be consistent with the term "functional play" as used in this thesis. It appears that whilst Jared was thought of as having "spontaneously generated more diverse and complex forms of play than previously exhibited in independent play activity", this was largely functional play and not spontaneous, symbolic play. Wolfberg describes this as, "spontaneous functional play, demonstrating his understanding of the ordinary uses and associations of objects". p.120. Although she continues in describing doll and telephone play as simple symbolic, these clearly do not involve symbolic transformations. It is also not clear whether there is a qualitative difference between this spontaneous functional play in which Jared says, "Hello" into a toy telephone and the type of spontaneous symbolic play frequently seen in normally developing children which is unprompted by the functional appearance of the play materials.

Freddy's play was largely functional but there were a few symbolic acts. Freddy yelled, "*Ouch it's hot!*" in turning on a pretend stove and said, "*Mmmmm, ahhhh delicious*" p.120 about play-doh (food). However given his previous experience and use of the delicious phrase (pages 104-106) in playgroups with the expert players, it seems unlikely that these were truly spontaneous. In one instance, Freddy transformed a plain, yellow plastic bottle into a bottle of oil. There was no obvious precedent for this and it may have been a spontaneous symbolic play act.

Of the three participants in Wolfberg's study, Teresa was the most able in play and in her language. In contrast to Jared, Teresa did use complex, symbolic play. In the quote below, Teresa uses a sequence of connected play acts including an imaginative appearance whilst sat on the toilet and the attribution of distress in the baby.

“(Make believe crying) Waaa! Waaa! Morrell is crying , waaaa. Morrell is crying. You okay, Morrell (Puts baby doll on counter, pulls pants down as though checking for a wet diaper, makes baby jump up and down on her lap.) You got to go to the bathroom, Morrell ? Time to go pee pee, right now, time to go pee pee...Pull a pants down (Pulls doll's pants down.) Pee. (Seats doll on make-believe toilet.) Ssss. Pull a pants up (Pulls doll's pants up, makes doll flush toilet.) Pshh. You went to the bathroom, you went, we all went ... You gotta put you shirt in the pants right now. (Tucks doll's shirt in pants.) Put a shirt in the pant, pull pants up, you hear me ? (Pulls pants up.) ... You all tucked in right now...”. p.186.

It is not clear how spontaneous this play act was, particularly as Wolfberg describes a similar play episode in which babies are crying together in the integrated playgroup. Wolfberg also describes Teresa as demonstrating an “*uncanny perfection with which she initially mirrored her peers in play which was reminiscent of her echolalic parodies*”. p.117.

In examining the evidence presented for these three participants, the children showed mainly functional play but Freddy and particularly Teresa showed some symbolic

play. Freddy may have created one spontaneous symbolic play act and Teresa probably created several.

Wolfberg continues in reporting that changes in the symbolic play of the subjects seemed to appear in tandem with changes in their verbal expression. Wolfberg did not measure the language abilities or the play levels of the participants of her study using standardised tests and so it is difficult to substantiate this claim. However in examining the transcript from Teresa one of the participants of this study, it is evident that her language level is complex and beyond the minimum language level of 24 months thought necessary for symbolic play (Cicchetti et al 1994: Lewis and Boucher 1988).

TERESA: ... *"I'm making cookies, too. We all making, we hope, we happy, we bake cookies. We put in oven, we put in oven right here. Okay, Keila ? I bake cookies, I bake it."* p.103.

FREDDY : ... *"Emiwee (Emily) what is your name ?"* p. 114 and

FREDDY : *"Sook (child's name), make pancakes. Points to oven."* p. 105.

Jared : *"Baby"*

Jared : *"Train"* ... p.107.

The underline was added by this author.

It might be suggested that if language and play are linked as Wolfberg claims, that Jared would not be expected to engage in symbolic play. However Freddy and Teresa might have produced higher levels of symbolic play than their language indicates. It is

difficult though, to find evidence to substantiate this statement as the methods used by studies into play differ considerably. It is also true that many of the studies that show children with autism can use symbolic acts within play under structured conditions also use subjects with higher language levels (Lewis and Boucher 1995; Jarrold et al 1996) than those in Wolfberg's study. Libby et al (1998) did use subjects with a mean VMA (rec - 29 m, exp - 27 m) that was roughly equivalent to Freddy in Wolfberg's study. That only low levels of symbolic play were shown by the subjects in both studies may be due to their language levels. Perhaps it is necessary for children with autism to have higher language levels than their normally developing peers in order to develop symbolic play in settings other than those used in highly structured experimental conditions. Perhaps the distractions presented by other children in relatively naturalistic play settings, prevents children with autism from using any symbolic ability that they may have developed. The answers to these questions were not found in the literature.

Do children with autism play socially ?

Although pretend play can be performed alone, there is a tendency for it to become increasingly socially based. Most children will gradually transfer the majority of this shared-play from a parent figure to friends and siblings. Symbolic play is enhanced through collaborating with peers in normally developing children (Howes 1992) and children with autism (Wolfberg 1999; Yang et al., 2003).

Teasing and tickling games are quickly understood by normally developing children in the first year of life. However, although children with autism certainly have a sense of humour they have been shown to have some differences in the expression of this. Reddy, Williams and Vaughan (2002) found that children with autism were less likely to communicate their humour either by trying to make people laugh or by humorous teasing behaviours. Other researchers have also found that children with autism are impaired in their expression of humour (Newson 2000; St James and Tager-Flusberg 1994).

What is the evidence for supported play development ?

Research has shown that in play situations, the communication of children with autism can notably increase. Many children with autism are often very poor at using eye-gaze in everyday life; however in social games, they may engage in similar amounts as their peers without autism (Whittaker 1996). Even those children who tend to use very low levels of communication have been observed to change the type of communication from largely requests for food and protests, to requests for positive social interaction - the continuation of non-verbal social games such as tickling and rough and tumble (Potter and Whittaker 2001). Rough and tumble games are sometimes played with children with autism (Nind and Hewett 1994); children who normally avoid eye-contact, can make frequent and meaningful eye-contact in these situations.

Several studies showed that there were social learning opportunities through play interventions with others (Wolfberg and Schuler 1993; Yang et al 2003). Wolfberg

(1999) who described an integrated play groups intervention with 3 subjects reported positive gains in all target participants in joint action, role enactment and role play.

“Jared learned to participate in simple turn-taking, using objects (e.g. building a block tower) or social games (e.g. hide-n-seek) as vehicles for joint action. Beyond joint action, Freddy learned role enactment, portraying real-life activities through conventional actions in social play scripts (e.g. pushing a shopping cart, loading it with groceries and handing items to a cashier). Beyond role enactment, Teresa learned role playing, taking on pretend roles with dolls and other people as well as using objects in imaginary reciprocal roles of mother and baby with a doll, pretending to take the baby to the bathroom while going shopping with her peers.” p. 149.

Kok et al (2002) found in a comparison of facilitated and structured play that appropriate communicative attempts were higher in participants during both interventions than in the baseline observations. The initiation of appropriate communicative attempts was higher in the facilitated play condition and the appropriate communicative response data were higher in the structured play condition. Kok et al. also showed that the inappropriate initiation and response attempts were also higher in the structured play observations.

Thorp et al (1995) found that levels of role play increased in the 3 participants, although there were difficulties in generalising this to other settings or with other people. All the subjects increased their spontaneous speech during intervention and this was maintained in follow-up measures. Two of the participants also showed a

decrease in inappropriate verbal behaviour, which was maintained after training. All 3 subjects also showed higher levels of positive social responses and social initiations and decreased inappropriate social responses during training and at follow-up.

Schlein and Rynders (1990) found increases in levels of social play in school aged integrated leisure programme. They found statistically significant increases ($p < 0.5$) in appropriate play behaviour in larger social groups (dyadic, group and team) and these were higher than the percentage of time using appropriate play in the isolate condition.

In a summary of this section there is evidence to suggest that play interventions that measure social engagement through play have shown positive gains. As was shown in the studies that sought to measure symbolic acts within play, the types of social engagement measured, the criteria for success, the range of methodologies used and the range of intervention types, led to an array of studies and any attempt to make direct comparisons between them is difficult. It is clear that very different interventions and studies do report gains in social engagement. As there are such huge differences between them the reason for this success is undefined and is worthy of further investigation.

Summary

In reviewing the literature on play and particularly symbolic play in children with autism, it is difficult to find clear agreement on which subjects should be chosen and how they should be grouped, how a successful intervention might be assessed and whether children with autism are capable of symbolic play and under which

conditions. There are many methodological differences between these studies, which contribute to the difficulties in comparing studies.

The main questions rising from the literature review are :

- If children with autism can symbolise within play, why do they not use spontaneous pretend play in unstructured settings ?
- Are children with autism more generative in certain circumstances ?
- Are children with autism always rigid or repetitious in their use of objects for play ?
- Is it possible to use structure to teach children with autism to use symbolic play in a relatively naturalistic setting and if so will this play be rigid and scripted or flexible, creative and generative ?
- Can children with autism and a language level between 2 and 4 years and no spontaneous symbolic play learn to pretend ?
- Does the presence of other children prevent children with autism from developing symbolic play ?

Methodology

Cohen and Manion (1994) define research methods as a range of approaches used to gather data, which are to be used for inference, interpretation, explanation and prediction. Cohen and Manion cite Kaplan (1973) in defining methodology as describing and analysing research methods so as to clarify their limitations, to measure their generalisability and make suggestions to improve the methods used. It is the study of the research methods as a process. Research methods can be considered to be on a continuum from positivist, objectivist and empirical to anti-positivist, inferential and subjectivist designs.

This chapter aims to briefly introduce research methods that are of importance to this thesis and fit these within a methodological framework. The methods used in research from the literature on pretend play and autism is analysed and suggestions for conducting similar research is extrapolated. A detailed examination of the research methods used in the studies of this thesis is made and these are tested for ethical validity. A particular focus on the use of inferential statistics and validity is given.

Quasi-Experimental and Pre-Experimental Research Designs

Experimental research tends towards positivist methods and a view of the social world that it can be influenced reliably and consistently by forces or variables external to the subject. As a full or true experimental design was not found in the literature and was not used in this thesis, it will only be briefly described here. A true experiment involves the use of randomisation of the participants into test groups, experimental

and control groups. The experimental group is exposed to an external force or independent variable and the resulting dependent variable is observed. Random allocation of subjects to groups poses serious threats to ethical validity of research in educational settings and serious problems in dealing with a population of children with autism in which their individual characteristics are so varied on multiple measures that an unmanageable group size would be needed in order to generalise to the wider population.

Other research designs that have some of the rigour of the true experiment have been used with children who are on the autism spectrum. Cohen and Manion (1994) describe one method as the one-group, pre-test-post-test, pre-experimental design. This design only uses one group and makes observations of the participants both before and after the experimental treatment or independent variable. This method whilst being much more practical in real-classroom based research is open to the influence of other factors that are not controlled for or external variables.

Quasi-experimental designs attempts to reduce the effects of these external variables by the use of a comparison or non-equivalent control group. The control group is described as non-equivalent because it is not equated by randomisation. In one design the experimental group and a non-equivalent control group is observed. The experimental group receives the treatment or intervention and then both groups are observed to find the effects of the independent variable. Errors due to chance variation in the participants can be reduced by matching groups so that they are as equivalent as possible. In some cases, twinning can be used in which each participant in the experimental group is matched or twinned with an equivalent subject who is allocated

to the control group. These twins are matched for criteria thought to be influence the results of the study or the effect on the independent variable. In many studies of pretend play and children with autism, language levels were used to match groups, as this was thought better than more global intelligence measures (Lewis and Boucher 1988). Several quasi-experimental designs have been used that use a comparison group that do not have autism. Instead these groups may have normally developing children or subjects with learning difficulties. These groups are usually matched on relevant measures and are used where the researcher attempts to find whether the dependent outcome/s are due to the autism, rather than the effectiveness of a treatment condition amongst subjects with autism.

Each research question must establish that the intervention does have a measurable or observable effect upon the participants in the research group/s and that this can be attributed to the intervention or independent variables. Threats to this internal validity include a range of variables, some of which are difficult to control for and some of which can at best only be acknowledged and can only be countered by accumulated weight of research leaning in the same direction (Jordan 1999b).

Research studies are also open to threats of external validity, which limit the ability to generalise from the study to other settings or a wider population. Studies that have not fully described all the independent variables make replicating the method difficult for other researchers. It is very difficult to describe all the extraneous variables that may influence the results of practitioner research in education. The participants used in autism research are rarely representative of the asd population as a whole. This is partly because the asd population is wide ranging on many assessable criteria and

partly because this population has such idiosyncratic variance that finding similar individuals to for matching is more difficult than with most other populations. Although the contribution that knowing one is being studied and the focus of attention is not necessarily as big a problem with some children with autism as other populations, the “Hawthorn effect” may still distort the research findings in some groups. It is also important to uphold external validity by ensuring the dependent variable should be relevant to the real world. Studies that have shown subjects with autism displaying symbolic play acts under prompted or elicited conditions (Lewis and Boucher 1988; Charman and Baron-Cohen 1997; Jarrold et al 1996) cannot easily generalise these findings to naturalistic settings as the dependent variable of frequency or type of symbolic play acts is not the same as real play. Real symbolic play contains many more features than the production of symbols alone (Garvey 1977).

Single-Case Research Designs

Single case studies do not attempt to use control or comparison groups to reduce the effects of extraneous variables. Instead they focus in detail on the development of a single subject or group of subjects over time. This research design often uses multiple measures and may have separate phases in which to use these assessment probes. This often allows the researcher to observe measurable effects over repeated intervention periods, which are separated with baseline periods. This is sometimes called an ABAB design, where A refers to the baseline or no-intervention periods and B to the intervention periods. This type of design allows the researcher to alternate intervention and no-intervention periods and thereby make judgements about the effect of intervention itself as well as any progress due to learning during the

intervention period or due to other variables such as maturation. Like other research methods using small samples, single-case research is difficult to generalise to a wider population and resulting data should be treated with great caution.

Yang, Wolfberg, Wu and Hwu (2003) used a similar design to the one described above. This used an A-B design in which data was collected from the baseline and intervention phases only. 5/19 probes were analysed from the baseline data for one subject and 4/17 for another child. The reasons for unequal numbers of observations were not given, unless inequalities occurred by using random selection of the probes. In using an A-B design, the authors did not have the opportunity to measure the effect of withholding the intervention. Whilst there is no reason to suggest this is the case, it is possible that the participants, having learnt how to play with others would then have much higher levels of functional and symbolic play when the expert players stopped using the intervention (integrated playgroups) method. Alternatively, the researchers could have chosen to introduce a generalisation phase, so that a second group of expert players who had no experience of the intervention method, could have been used to provide a subsequent A-B phase. This would have allowed the researchers to examine the effect of withholding the intervention. Additionally, an analysis of the second intervention could have examined whether the target children had maintained, decreased or increased their levels of play. Yang, Wolfberg, Wu and Hwu claim little for the generalisability of this study to the wider population, except that the findings were in accord with the other research by Wolfberg. Inter-rater reliability scores were given and were 88 percent for social play and 91 percent for the cognitive/symbolic play. The validity of the study was investigated using semi-structured interviews. These were conducted with the expert players and the parents

at the end of the intervention phase to assess whether the playgroups had been valued by the interviewees and whether there had been changes in the play of the target children.

The Literature Review looked in detail at a range of studies that are of importance in their research methods. Studies were chosen that were distinct from each other and represented to some degree characteristic styles of research into the play of children with autism.

Research methods used in this thesis

The research methods used in Studies 1 - 4 also cover a range of approaches, including case study, pre-experimental and quasi-experimental designs. Each of these was chosen to add detail to the thesis, bringing different perspectives to similar questions.

Study 1 used a case study design within a practitioner research framework. A case study design was chosen to examine a simple question: is it true that a structured play intervention will increase the symbolic play acts used by young children with LFA and receptive language of 20 - 34 months ? The case study also allowed a naturalistic intervention to be undertaken with a group of five children in a generic special school class over a period of 15 working weeks. Study 2 also used a case study design. However in this case, two intervention periods of four weeks were used. In the first intervention, structure was used as an independent variable and in the second, affect was used. In practitioner researcher case studies there are inevitably concerns about the reliability of the procedures and the findings. Attempts to increase the reliability

of such studies are important, if they are to have value to other researchers and practitioners.

In both Studies 1 and 2, this author acted as play tutor and was participant in the sense of steering the procedures, adapting the presentation of the procedures to the responses of the participants and sometimes in recording the play of the children on video or using real-time observational coding. This author also analysed the video data, although a second rater was used on both studies. Being so closely involved with the design and the operation of the research allowed some advantage in that the researcher was able to use his knowledge of the subtle individual differences between subjects to aid the design of, and implementation of an effective intervention for those participants.

There were substantial disadvantages to the use of a practitioner researcher, with particular challenges to the reliability of the research. This type of research is open to criticisms of subjectivity in the design, implementation stages, analysis and interpretation of data stages. However, there is some justification in the use of practitioner research in this case, in that the research question had not previously been shown to be successful. It is an important question that other research had attempted to explore, but these used more able subjects or related, but different research questions. There is also some justification in the use of practitioner research in exploring such a difficult and complex question if any positive results can be subsequently repeated using different samples and research methods.

Within this thesis, further opportunities were made to examine the results of Study 1 by using Studies 2, 3 and 4. The use of video to record the participant's response to the interventions, provided increased objectivity. The coding of some of the video data was checked by an independent rater. In study 2, objectivity was further increased by masking the rater to the condition. The advantages of practitioner research in sensitively tuning the intervention to the particular needs and abilities of an established group (such as a group of children with autism in a special school) also entails a further challenge for its reliability. If the tuning to the needs of a group of individuals was important in the success of such an intervention, would the same intervention be successful with other subjects, other schools, other age groups and ability levels. Can practitioner research be generalised to a wider population ?

There are certainly difficulties in generalising the results of Studies 1 and 2 to a wider audience. Yet such studies do have a value in highlighting possibilities, adding detail and exploring areas of research that rely on the dynamic, interpersonal responses. Such studies can be used to augment, refine or inspire future and more objective research. Occasionally the results of such studies may show a pronounced and uniform effect or perhaps more typically, a substantial gain on the dependent variables or research foci across the majority of participants. In these cases a suggestion can be made, that the results may have relevance to other people in a wider population of children with autism with similar baseline profiles. It would clearly not be possible to claim that the results could be generalised to anyone with autism, regardless of age or ability. Great caution must be exercised, even in suggesting that other children with similar profiles to the participants may also make similar gains using the same intervention in the same conditions. Children with autism are

particularly difficult to group and are heterogeneous in often idiosyncratic ways. These ways are not understood and any attempt to suggest the effects of particular dimensions would be speculative and unnecessary in studies such as these. Inferential statistics were used with caution in Studies 1 and 2 as these were exploratory in nature.

Study 3, used a pre-experimental design (Cohen and Manion 1994) to examine the responses of participants under different conditions. No control or comparison group was used and the participants acted as their own controls. Each intervention condition was preceded or followed by a non-intervention condition. This type of research design has some similarities with case study and might be considered to be an ABABAB or BABABA design across twelve participants. It has similar weaknesses to the case study in its failure to provide a control group. This makes the attribution of the results to the intervention more difficult, although using the participants as their own controls does make comparisons between intervention and non-interventions conditions possible. This allows some claims to be made about the effects of each intervention compared with each other and with a low intervention condition. It does not have the power to claim that the results can be generalised to a wider population. Rather the results provided some explanatory detail to add to Studies 1 and 2.

Study 3 did not use practitioner research. The conditions were only 3 minutes long and carefully constructed so that they could be replicated between participants fairly. As there were two researchers and comparisons were made between these, it was important that each researcher was consistent in the presentation of the condition. This study incurred the potential for less subjective bias than Studies 1 and 2. The

participants were unknown to the researchers prior to the interventions and were being educated in other special schools. The procedure involved subjects participating in three conditions with two researchers. The order of these was sequenced so that the number of participants who were tested under each condition first, was equal. Subjects were randomly allocated to a sequence group and to researcher 1 or researcher 2, (e.g. subject x - condition, b, then c and then a - researcher 2). Bernard-Opitz et al (2004) found there was a carry over effect from the previous condition in their cross-over design. Participants in Study 3 were allocated to a sequence group to reduce the effects of carry-over. The random allocation reduced the possibility of bias in the selection of sequence groups. The use of two researchers working with all participants allowed greater confidence that the results were due to the intervention conditions, rather than the characteristics of a single researcher.

Study 4 used a quasi-experimental research design using a comparison rather than a control group. This comparison group consisted of children with learning difficulties and was tested to make comparisons with the autism group. In Study 3, the research question was relatively absolute. The study attempted to investigate which condition produced the highest levels of symbolic play relative to each other. Study 4 was more exploratory. The main aim of Study 4 was not to generalise findings to either population but to inform the previous studies by adding to it a different type of finding, from a different type of study.

Threats to the validity (Cohen and Manion 1994; Dunbar 1998; Edwards and Talbot 1999) of Studies 1 - 4 include the following:

That the participants have been influenced by other variables during the course of the intervention. Longer interventions and longitudinal research studies are particularly prone to this, such as Wolfberg (1999). The effects of this may be reduced by the use of probes that assess progress at more frequent intervals than pre and post intervention. The length of study can also have an influence on the maturation of the subjects and any resulting gains in performance of the subjects may be partly attributable to their maturation. Studies 1 and 2 were prone to these.

There are threats to internal validity due to the unreliability of the assessment tools used to make measurements at pre and post tests. Any error in the assessment at pre-test will have an effect on the measured gains from the post-test result giving a statistical regression. As any standardised tests were only used for baselining and matching prior to the interventions, this threat is low. There were assessments made using observable data.

The use of pre-testing may have an effect on the post-test results due to practice effects or pre-priming the subjects to the nature of the experiment.

Instrumentation - further flaws may be introduced into the study by the use of unreliable assessments or a mixture of assessments. Charman and Baron-Cohen (1997) used two assessments for verbal mental age and two for non-verbal mental age as the ability range of the participants exceeded that of the tests. Similarly, Libby et al (1998) used two assessments. Additionally, many of the research studies in play and children with autism have devised criterion-referenced assessment schedules and many of these are particular to the study from which they came. Their reliability comes from stringent coding of the criteria used in the assessment and measurement

by different raters. However raters are prone to variation in interpretation, misunderstanding, bias and fatigue both as individuals and as part of a team of raters. If the lead researcher has particular views about the validity of coding judgements in the training of other raters the validity of the study would be threatened.

In choosing how to organise participants within the study, the researcher is open to further errors. In selecting subjects to form groups or in choosing to use a pre-defined group such as a school group, the possibility and probability of bias is increased. In longer studies, there is a greater risk of participants leaving due to change in class, school or moving house. The effect of this is to remove their data from the study making the groups less equal. Even in short studies, there is a possibility of biasing the result if participants drop out of the research when a subject decides that they no longer want to participate further or do not wish to complete the post-test assessments. Charman and Baron-Cohen (1997) found this to be the case even on pre-test assessments used for matching groups. They used incomplete data to match subjects on verbal mental age (3 subjects) and non-verbal mental age (4 subjects). This was an issue in Studies 1 and 2. The school used for the study has a high proportion of children leaving each year. In Study 1, two subjects were no longer available for follow-up assessments after the three phases were completed. In addition, one of the participants would not cooperate with the post-intervention play assessment. Although he did cooperate six months later, this datum was lost to the study. In Study 2, one of the subjects left following the study.

Face validity is concerned with whether these four studies really assess what they aim to. Criterion validity considers whether the criterion used in the assessment correlates

well with other external measures of relevance. A criticism of all the studies is their ability to effectively test the generalisation of symbolic play. This is because play is not about performing upon request, but about the pleasurable exploration of ideas and feelings. Were the studies really assessing play and had the interventions in Studies 1 and 2 affected a change in the aptitudes or abilities of the subjects ? If so, it could be asserted that the studies should have followed up the interventions with observations in other settings and with other people. This would have provided a truer measure of the participant's behaviour and would have improved the face and criterion validity of the studies.

Wolfberg (1999) and Schuler and Wolfberg (1993) did attempt to assess play in some generalisation settings. These studies also triangulated the observational data with interview data from significant others. However these methods are also open to criticism. To make an observation in a home setting, is likely to influence the results of it. The presence of the researcher is likely to influence the parents' views, the way they establish the play environment and the way that they may or may not interact with the subject. In interviewing the parents about progress in the play of their child, the parents may become biased towards a positive outcome, trying to comment positively on the behaviour of their child. Using a generalisation setting that is unfamiliar to the child, may provide an alternative. Schuler and Wolfberg (1993) attempted to use a generalisation room that was unfamiliar to the subjects. Unfortunately, their results in this setting were not as positive as the more familiar settings.

Study 2 used a generalisation assessment in the playground of the children's school. This was an attempt to measure any progress in the symbolic play of the participants outside the intervention setting. Although opportunities existed for the subjects to play with other children of similar ages to themselves in the playground, this was not structured in. Study 1 used Phase III to assess the participant's generalisation following the intervention phases. However Study I did not attempt to use an unfamiliar setting or different play partners. The play materials available in Phase III were different but similar to the previous phases. This contributed to a generalisation effect.

As the criteria for the assessment of symbolic play are the categories of symbolic play acts observed by the participants, Studies 1 and 3 all have adequate construct and content validity. Although not strictly necessary for symbolic play aspects of spontaneity and social interaction are relevant constructs. These were not assessed in Studies 1 and 2, but were commented on. Whilst an assessment of generativity in the style of Jarrold et al (1996) was not attempted, a standardised test was used in which the ability to generate novel play acts is scored. The Test of Pretend Play (Lewis and Boucher, 1997) assesses the ability to make symbolic transformations with and without a prompt or elicitation. Subjects who score highly on this measure are likely to have an ability to generate play acts and potentially to generate spontaneous symbolic play.

Sample size has an effect on the ability of the results to be generalised to a wider population. Not only may a small sample not be representative of even a specific population but it may also skew the results away from a normal distribution pattern,

invalidating the use of inferential statistics. Dunbar (1998, p.159) suggests using sample sizes that have been used in other successful studies as a guide to the number of participants that would allow the use of inferential statistics. Studies that are in any way comparable with those in this thesis typically use very small samples. These are often not typical of the specific population of children with autism. This population is heterogeneous and may have wide variation in language, developmental level and IQ. Particularly scores have been shown to be unreliable with this population (McGovern and Sigman 2005; Gabriels, Hill, Pierce, Rogers and Wehner 2001). Any data analysis used in this thesis should be treated with caution.

The research methods used in Studies 1 - 4 are varied, each one being subject to different threats to their validity and reliability. The details of these threats were examined above. To summarise, Studies 1 - 4 should be seen as exploratory, practitioner research. The studies seek to explore the questions of why these methods might work; to ask, which are the critical variables in the interventions ? The results of these studies should be viewed as contributing to a wider understanding of the pretend play of a particular group of children with autism.

Ethical Considerations

Dunbar (1998) describes three themes that should guide the ethical design of psychological research. These themes are derived from the ethical codes of the ethical bodies of psychological associations. The themes are deception, protecting participants from harm and confidentiality.

In considering whether subjects will be being deceived if they become participants in a study is often a straightforward question. Sometimes there are exceptions to this in that it is important at least at first to deceive the participants. On other occasions, it may be permissible to inform the participants after the procedure has been completed and gain their permission to use any data retrospectively. In the case of children, who cannot be expected to understand the concept of research or informed consent, then adaptations to this permission may be possible. Fine and Sandstrom (1998) cited in Cohen and Manion (1994) suggest simplifying the language used with very young children. However in seeking informed consent from young children with LFA, some of whom have little language and poor communication skills, the notion of informed consent needs to be redefined.

One way that this can be done is in requesting permission to participate in the study from the subjects' parents. As much information should be provided as is informative to the parents, so that an informed decision can be made. Parents should be informed about the aims of the study, the nature of the procedure and the intervention. They should be given some idea of the purposes and the scale of the study and why it is worth doing. Parents should be informed of the benefits of the intervention and any dangers or negative implications of it. They should have information on whether it is possible to terminate the child's role in the procedure and what would happen to the data collected on their child in this event. Parents should also be given information on the confidentiality of any reports that might result from the study. Finally, some assurance that any information collected on the child would be open to parental inspection and treated sensitively in any reports or communications with others, should be included. In practice, this is a considerable amount of information for

parents to consider and even if clearly written would challenge the literacy of some parents (Bernard-Opitz 2004). It may also discourage some parents who believed that research that required such detailed caveats, was probably not in the best interests of their child. A judgement should be made about the welfare of the child and the need to provide lengthy explanations of the ethical code for the study, in seeking permission for a child to participate in a study.

Although it is not possible for many children with autism to give informed consent for a study, other ways of measuring their willingness to participate are both possible and desirable. In selecting suitable subjects for a study, it may be possible to create a similar setting that does not undermine any baseline data on the research. Instead it should allow the child an opportunity to demonstrate a willingness to participate in a similar situation. In the case of a study on pretend play with a group of young children with LFA, a parallel situation might involve watching them respond to a stranger entering the room with a bag of construction materials. In a table-top 1:1 testing situation, a parallel situation might consist of a stranger asking a potential subject to sit at a table and look at a book together. These situations would allow the researcher to gauge whether a child is likely to respond positively to the intervention. The researcher might also take advice from carers and professionals about their expectations of the child's response to the research.

The participants in Studies 1 and 2, were all incapable of giving informed consent, even in a simplified form. Written parental permission was given for all participants, following a letter of explanation and a telephone call to offer any explanations that might be necessary. Play is an enjoyable experience for most children and if the play

intervention is appropriate, this should also be true of children with autism.

Participants in Studies 1 - 4, had an opportunity to not participate with the intervention at any time.

It is clear that participants in research should not be harmed in any way, even if permission has been given. For research involving children with autism, this is particularly true. The communication difficulties of many children with autism, may prevent them from withdrawing from the research or even from realising that the procedure was harmful or against their well-being. If children with autism who were unable to process verbal communications quickly, participated in a study in which the independent variable was the speed of verbal instructions, distress or confusion which was detrimental to the well-being of the subject might result. This would be ethically unsound.

Would this situation occur in the symbolic play of children with autism ? Studies 1 - 4 used the principle described above, that participants could withdraw from the research situation at any time. This was a safeguard against the interventions having undesired effects on the subjects of the studies. Whilst the experimental research designs may have more difficulty in creating an environment in which the participants gain pleasure from their play, these problems were not reported in more naturalistic research reports (Wolfberg 1999; Bernard-Opitz 2004; Yang et al 2003).

Whilst it is normal to protect the identity of participants in research reports (Dunbar 1998) it is sometimes more difficult than changing someone's name. Children with autism are a small part of the population. When their identity is further defined in

terms of type of school, age, educational achievements, language levels or the use of short behavioural descriptions, it is difficult to maintain full confidentiality and anonymity. The extent of the confidentiality should be disclosed to the permission giver as part of the informed consent. Once again, the well-being of the subject should remain paramount. If the study examines the positive play development of a subject, rather than confirming the difficulties that children with autism have in play, then the need for confidentiality may not be as great. If a study investigated the incontinent behaviour of a group of children, then the need for confidentiality would need to be increased. In Studies 1- 4, participants were given a false name or a code. Parents were informed of the extent of the confidentiality and the purposes of any written reports and permission was granted before any research was started.

This chapter has considered the research design for studies in this thesis. It has identified some of the issues encountered in this type of research and has made comparisons between different methods. These were used in the design of Studies 1 - 4.

Study 1

Introduction

The Literature Review showed that children with autism may display a range of rigid repetitive and often idiosyncratic behaviours and also show a delay or impairment in symbolic play, creativity and imagination. Many children with autism use no pretend play or are impoverished in the quality of their play. Several articles have explored this impairment and considered its significance for our understanding of autism (Baron-Cohen, 1989; Leslie, 1987). In particular some studies have found that children with autism who did not spontaneously play symbolically could demonstrate acts of symbolic play when prompted to do so (Jarrold et al., 1996; Lewis and Boucher, 1988; Thorp et al., 1995).

This experiment explored whether a group of five children with autism could learn to use pretend play through the use of a structured play intervention. The play intervention was designed to build on the work on structuring play (Lewis and Boucher 1988) and incorporate the modelling, prompting and elicitation of play acts implicitly and explicitly within the structure of the intervention. The children were observed over three intervention phases over a period of four months. The children began with the most structured phase and the level of structure was reduced incrementally in the following phases.

Although the children with autism did not demonstrate spontaneous symbolic pretend play prior to the intervention, there was significant progress with all participants. Some of these were able to demonstrate symbolic acts in different settings, others became able to engage others socially within a play episode that involved complex symbolic manipulations spontaneously in unstructured settings.

Method

Participants

Five children aged between 5 and 6 years of age, all with a diagnosis of autism and additional learning difficulties were involved in this study. Within this document, the children are known as Oliver, Dan, Richard, Buck and Aaron. All the children showed the triad of impairments (Wing and Gould, 1979) that is characteristic of autistic spectrum disorders, and were shown to have high scores (Table 1) which indicated autism on the Childhood Autism Rating Scale (CARS: Schopler, Reichler, Rothen and Renner 1988). In addition, autism was specified as the primary need on their statements of Special Educational Needs. The children had been in the taught together for 5 months prior to the intervention. None of the children had used any symbolic play at school in formal or informal observations prior to the intervention. All the children were tested for verbal comprehension using the Reynell Developmental Language Scales (Reynell, 1977). All had a verbal comprehension level of less than 34 months and a non-verbal cognitive level of under 66 months at pre-intervention tests. The children all had learning difficulties and were based in the same class of a generic special school. Details of the participants are included in

Table 1. Additional qualitative information about each participant is given in Table 2.

This was a case study investigation and thus no control group was used.

Pre-test and post-test assessments

Pre-test and post-test assessments were carried out with all the children.

The Reynell Language Developmental Scales (RLDS: Reynell, 1977) were used to assess verbal comprehension. The Test of Pretend Play (ToPP: Lewis and Boucher, 1997) was used to assess the developmental level of each child’s symbolic play. Finally the Symbolic Play Test (SPT: Lowe and Costello, 1989) was used to provide additional data for those children who demonstrated lower levels of pretend play (the SPT provides an assessment tool for functional play rather than symbolic representations). As younger children use a much higher proportion of functional play within their repertoire, this complements assessment with the ToPP.

	Verbal Comprehension	Symbolic Play Test	Test of Pretend Play	Childhood Autism Rating Scale
Dan	2:10	2:2	3:9	31.5
Oliver	2:4	3:0	3:0	32.0
Aaron	2:3	2:11	1:5	36.5
Richard	2:1	2:11	2:3	40.5
Buck	1:8	2:8	1:7	45.5.

Table 1:1 Test scores for the children with autism at the pre-intervention tests

Dan	Dan was a child with some bizarre behaviours such as squealing in a high pitched voice and jumping up and down for lengthy periods of time. Dan only interacted with other children to tease them and make them squeal. Dan had strong interests in particular objects which often dominated his speech. At the time of writing Dan was interested in the journey of the school bus.
Oliver	Oliver could follow simple instructions and could make simple verbal requests. He was comfortable around other children but did not attempt to play with them. He would quickly confront anyone who broke his expectations of behaviour.
Aaron	Aaron was a socially detached child who always looked uncomfortable around other people. He would sometimes get excited and found it difficult to calm down as quickly as the other children in the group. Aaron had no interest in play materials and liked to copy writing from wherever he could find it.
Richard	Richard appeared to take much longer to process information than the other children in the group and sometimes looked as if he were in a dream. He would occasionally get very upset for no apparent reason. Richard was highly echolalic and found it difficult to communicate even simple desires effectively.
Buck	Buck only spoke a few words and had some phonological difficulties. He had not been very successful using a symbol communication system, although he could use some of these in routine situations. Buck disliked sitting in a group and would not watch a video or join in music lessons.

Table1:2 : Information about the subjects.

Examples of children in formal and informal play situations were recorded on a video camera over a 4 month period. Play episodes in structured play sessions were recorded on video in an early years classroom on Wednesday afternoons during the course of phases I and II. Examples of spontaneous symbolic play that occurred in phase III were sporadic and difficult to predict and consequently to record. However, time was allocated on Wednesday afternoons for unstructured play. When play occurred spontaneously on these occasions it was recorded. Additional observation data were used on four occasions. Each play event was recorded until there was a clearly defined termination in the children's play. The video data were not of equal length as this was determined by the quantity of play (time periods ranged from 2.5 to 15.5 minutes). Recorded episodes contained the play of an individual child or a small group. Play acts were coded and any data resulting from a single episode were not directly compared with those from another, other than in the total number of symbolic acts used. The choice of data-gathering tools was made to build a comprehensive picture of the nature of pretend play. The broad range of abilities shown by the children and their behavioural unpredictability required a range of recording methods. The use of video provided a rich source of data for qualitative and quantitative analysis.

The video recordings were coded for the three symbolic representations found in symbolic play: (1) object substitution, (2) attribution (attribution of false properties)

and (3) reappearance/ disappearance (imagining the appearance or disappearance of an item that was not in reality present). Examples are shown in Table 3 (based on Leslie, 1994). Any quantitative data resulting from the video analysis should be treated with caution as the total number of items or events were small (94 symbolic acts).

An interrater agreement was calculated for the sum of each symbolic act (Table 2) used by the children in three play episodes. A Pearson correlation of 0.97 was achieved.

Symbolic play act	Symbolic play criteria
Object substitution	The child decouples a representation of a real object, e.g. a banana, and allows another object to act as if it were the referent, e.g. telephone
Attribution	The child attributes false properties to an object, e.g. a dry table is acted on as if it were wet
Imaginative reappearance/disappearance	The child acts as if an object was in existence or was not in existence.

Table 1:3: Categories of symbolic play

The intervention

The intervention was structured to promote the development of symbolic play. This may be seen as three phases of approximately 5 weeks each. Play sessions were used for three 40 minute periods each week. The intervention had the following characteristics:

Phase I

- 1 The teacher modelled a play script, then individually invited each child to play using the same materials.
- 2 The play scripts were based on familiar stories, e.g. 'The three little pigs'.
- 3 Single or simple symbolic transformations were used, e.g. this box is the house of the three little pigs.

Phase II

- 1 The teacher selected the materials and set the parameters of play by example.
- 2 Flexible play scripts were guided by the materials provided, e.g. the subject worked in a fruit shop but pretended to serve customers in a variety of styles, such as being very clumsy, hungry, greedy or obliging.
- 3 Multiple transformations were demonstrated, e.g. dolly burnt her leg with the imaginary cup of tea.

Phase III

- 1 The teacher gave no guidance but made suitable materials freely available for designated times.
- 2 The materials did not suggest particular previous scripts, stories or play sessions.
- 3 The play was resourced with a greater proportion of non-representational materials.

The intervention also used the following social and affective dimensions in the three phases:

Phase I

- 1 The teacher led the scripts and used enhanced expressions of excitement, pleasure, horror, surprise, desire, shock etc.
- 2 The children watched the teacher or individual peers at play in real time and on video as well as participating in play scenarios themselves individually.

Phase II

- 1 The teacher demonstrated flexible and spontaneous play and used expressions of excitement, pleasure, horror, surprise, desire, shock etc.
- 2 The children watched the teacher, then played in selected pairs.

Phase III

- 1 The children were shown a video replay of any resulting spontaneous play.

In phase I, the teacher used a high proportion of modelled teaching. In this the teacher presented the materials and highlighted their significance to the class. The teacher was explicit in highlighting the symbolic transformations that were involved. Having modelled an example play scenario, the teacher asked the children to play individually. Whilst the children were involved in this play the other

children were expected to watch. It was hoped that the children observing the play within a structured setting would see similarities and differences between their own play and that of others. The teacher was able to replay some of the more engaging video recordings, highlighting the most significant points. In phase II, the degree of structure was decreased and less scripting was used. Introductions of novel substitutions and representations were applauded by the teacher. The children were asked to play in pairs and groups. In phase III, little guidance was given by the teacher. Times to play were allocated by the teacher and resourced with novel representational and non-representational materials.

The materials used were a combination of representational materials and non-representational (junk) materials. The emphasis towards junk materials increased throughout the programme and gave increased opportunities for symbolic representations (particularly object substitutions). The materials often included a subject character, with which the child could pretend. Sometimes this involved a doll or puppet; sometimes the subject was played by the child. Other representational materials often included cars, plastic and cuddly animals and plastic food. Junk materials included cardboard and plastic boxes of various sizes and shapes and frequently objects from around the classroom.

A key feature of the teaching approach used in this programme was “affective marking” to create a motivating social focus to the play activities. Affective marking involves highlighting the significance of an event by the

use of an emotional expression or gesture. This class group had significant difficulties in attending to a joint focus in any school activities. All the children had also experienced difficulties in attending to a joint focus within pairs and to a lesser extent with familiar adults. The use of melodrama and affect within the modelling of play scenarios was designed to enhance joint attention and was a core feature of the teaching approach. The other method of motivating the children to attend involved using play objects that held an inherent motivation. These were perhaps new or exciting objects.

Results

The results of the intervention study were as follows. Tables 1 and 4 present data from pre-test and post-test assessments respectively. Owing to the difficulties that some of these children have in completing formal standardized tests, these results should be treated with caution. Between the pre- and post-intervention tests (4 months) the children made the following progress using ToPP: Oliver (5 months), Aaron (12 months), Richard (6 months) and Buck (2 months). Dan refused to be tested following the intervention but tested 6 months later as 4:0 years, (an increase of 22 months over his initial score).

	<i>Verbal Comprehension</i>	<i>Test of Pretend Play</i>
Dan	3:0	–
Oliver	2:10	3:5
Aaron	2:6	2:5
Richard	2:2	2:9
Buck	1:10	1:9

Table 1:4: Standardized test scores for the children with autism at the post-intervention tests.

A related t-test was used to compare the variability between the pre and post test verbal comprehension scores of the participants. This showed that the difference was not significant ($p > 0.2$). A related t-test was used to compare the variability between the pre and post test symbolic play scores of four participants (Dan did not complete the post-intervention assessment of ToPP until later). This showed that the difference had a low level of significance ($p < 0.1$). Caution should be exercised in generalising from this due to the very small number of participants used in this study.

Samples of data taken from the transcription of video recordings are presented in Tables 5,6 and 7. The samples have been selected to illustrate the progress made by one child, Oliver, over the three phases of the intervention.

<i>Substitution</i>	<i>Attribution</i>	<i>Disappearance / reappearance</i>	<i>Functional play</i>	<i>Comments</i>
1			12	5 minute, solitary, continuous play using an upturned chair, a glove puppet and two model animals. A modified narrative based on teacher model.

Table 1:5: Phase I: example of functional and symbolic play, Oliver

<i>Substitution</i>	<i>Attribution</i>	<i>Disappearance /reappearance</i>	<i>Functional play</i>	<i>Comments</i>
	2		9	200 seconds, collaborative play which was broken by a pause of 30 seconds. Materials were dinosaur puppet and several plastic animals. Children were shown the materials and asked to play in pairs

Table 1:6: Phase II: example of functional and symbolic play, Oliver (playing with

Dan)

<i>Substitution</i>	<i>Attribution</i>	<i>Disappearance / reappearance</i>	<i>Functional play</i>	<i>Comments</i>
2	3	5	19	15 minutes and 30 seconds, spontaneous, collaborative play. Materials used were dinosaurs, gorilla, several plastic animals, plastic eggs and a box.

Table 1:7: Phase III: example of functional and symbolic play, Oliver (playing with Tony).

The phase III example presents data from a novel and spontaneous play narrative between Oliver and Tony. Oliver wanted a plastic egg that Tony had taken. Oliver pretended that this egg belonged to his dinosaur model and used the dinosaur to trick (unsophisticated) Tony’s gorilla. The two children interacted throughout the play episode (with the exception of two short pauses). The story developed through their mutual interaction.

The intervention was designed to encourage symbolic play. Progress was apparent from the increase in the scores for ToPP. This was supported by evidence from observational and video data. The three examples of video data summarized for Oliver (Table 5, 6 and 7) are typical of the progression shown by four of the five children in the study. Although Buck made progress he was still

operating almost entirely at a functional play level at the end of the intervention.

Richard, Dan and Aaron were all able to use symbolic acts within their play by phase III.

Children used different combinations of symbolic play on different occasions. Some of the most capable children did not use any symbolic functions in some episodes. The children sometimes combined several symbolic functions within one play act or sequenced these closely within the episode. The symbolic play acts were often combined with functional play acts. Four of the children used acts of object substitution, attribution and reappearance/disappearance within their play.

An act of attribution was shown by Dan in phase III. Dan had two identical plastic cows. These were being threatened by Oliver's dinosaur. Dan pushed the two animals together and said, 'No, my Mummy' and then 'My Mummy, all mine.' In this Dan appeared to attribute a relationship to the cows and within this act, attributed a fearfulness to one of them. In a second example within the same play sequence, Dan turned a toy cat to a cow and said 'Don't worry.' In this the cat is attributed with trying to comfort the anxious cow.

In a similar example from phase III, Richard used an object substitution and a disappearance act. The growling dinosaur was threatening a donkey which had been running away and shouting. Richard found some plasticine (clay) and covered the donkey's ears with it. (Richard often covered his ears with his hands to block out sounds.) The donkey then rammed the remaining plasticine ball into the dinosaur's mouth. Richard

said, 'Teeth . . . Teeth fall out.' Richard used the plasticine to substitute for headphones to keep out the sound and used a disappearance act in pretending that the dinosaur's teeth had fallen out.

In an act of attribution, Aaron constructed a scene in which a doll was used to dismiss a tiger. Aaron said 'Go away' and the tiger was hidden. The doll stroked a toy rabbit's head gently and repeatedly, then he laughed. In an act of object substitution, Aaron took the rabbit onto a chair. The rabbit jumped to the floor and walked under the chair where it went to sleep. Aaron said, 'In rabbit hole.'

Of all the symbolic functions observed, attribution was the most frequently used. Substitution and then reappearance followed this in frequency (see Table 8). The values included in Table 8 show the sum of symbolic play acts from video and observational data, taken from all three phases. There were no clear differences in the symbolic play profiles between children.

The five children with autism all made substantial progress in the quality of pretend play that they were able to use by the end of the study. For some of these children there was a marked increase, which was generalized to less formal and free play situations. As for all these children, the behaviours reported in this project were the first times that they had been recorded or seen in school.

In the year after the programme and following a further intervention, the play of Richard and Aaron remained symbolic but had a repetitive quality to it. Dan was able to generate some spontaneous symbolic play episodes of exceptionally high quality. No further data were collected from Oliver and Buck.

<i>Substitution</i>			<i>Attribution</i>			<i>Reappearance</i>		
NV	NO	%	NV	NO	%	NV	NO	%
19	8	29	41	13	57	10	3	14

Table 1:8: Frequency of observed symbolic acts

Discussion

There was evidence that gave some support to a performance impairment (Jarrold et al., 1993) being responsible for the lack of pretend play in these children. The use of modelling, prompting and eliciting, which has produced significant changes in play in previous studies (Charman and Baron-Cohen, 1997; Lewis and Boucher, 1988) was an inherent part of the play programme. These strategies were initially used to structure the play and enabled all the children to participate (at their own level). As the programme proceeded the structure was faded out (phases II and III). Some of the final observations were in free play situations and produced creative and flexible acts of spontaneous pretend play with their peers. A performance impairment might explain the speed by which some of the children were able to demonstrate novel symbolic acts. Experiments that have examined

a generativity impairment (Charman and Baron-Cohen, 1997; Jarrold et al., 1993; 1996) have suggested that children with autism can display play skills in prompted and elicited conditions. However, through this intervention, the children not only demonstrated play skills under prompted or elicited conditions but also brought pretend schemata into use in new situations. Some children ultimately used symbolic play spontaneously in unstructured settings.

Another explanation for the children extending their play beyond the early stages of the intervention might relate to the affective engagement of the children in their play. The most frequently used symbolic play act in this study was attribution. This was unexpected in light of the findings of Libby et al. (1998). The symbolic play acts of children with autism in Libby et al.'s study consisted almost entirely of object substitutions. Possibly acts of object substitution mature earlier within normal development than other forms of symbolic play. Had Libby et al.'s participants had lower developmental ages than the children in the present study, this might have offered an explanation. However this was not the case, as the language comprehension of the autistic group (mean = 29 months, SD = 4.8) was similar to that of the children in Libby et al.'s study (mean = 27 months, SD = 5.1), this is an insufficient explanation. However, an alternative explanation is that the affective techniques used in this intervention were responsible for the atypical result. In a short-term teaching programme used by Hadwin et al. (1996) 10 children with autism made small gains in symbolic play but failed to develop spontaneous play. Similarly in another brief programme to develop the play skills of 12 children with autism, only very minor gains were made in symbolic play (Berckalaer-Onnes,

1994). The lack of affective involvement by others in these play programmes may have been important in this. This suggestion would be cautiously supported by the positive results found by Wolfberg (1999) and in an unevaluated approach by Beyer and Gammeltoft (2000). Both these long-term teaching approaches actively use other children. Both approaches value the social and affective aspects in the play process.

Conclusion

The results of Study 1 showed that in the course of a 4 month intervention programme, five children with autism were able to exhibit some symbolic acts within unprompted settings. In phase III, the most able players were able to engage within episodes of spontaneous play that incorporated complex symbolic manipulations.

The findings suggest that a structured play approach enabled the development of symbolic play and also suggests that some of the symbolic play was not the result of replicating previously modelled examples but was spontaneous and novel. This was an important finding. It was not clear whether this result was entirely due to the systematic use of structure within a play programme or whether it was influenced by other factors that were not designed in. In particular, highly affective play has been suggested as a possible important feature of this intervention although high levels of affect were not a planned design component. In Study 2, reported next, the influence of the use of high affect on the outcome was further investigated. Study 2 was specifically designed to investigate the role of affect in structured play for teaching children with autism to develop spontaneous symbolic play.

Study Two

Introduction

In Study One, it was shown that five children with autism who had previously shown no examples of symbolic pretend play showed evidence of it. Following a structured intervention some of these children started to use symbolic pretence spontaneously in social play. All the children were able to construct novel play sequences in elicited or prompted situations. Three variables were identified which may have been effective in this play development. These variables were structure, affect and repetition. Affect is the emotional expression that was used in the preliminary study to maintain the interest and attention of the children. Affect used exaggerated expression, large gestures and simplified language content with high communicative intent. These features can often be seen in pantomime and many children's television programmes. Structure clarifies the requirements of the activity for the child. It used a simplified language structure, emphasising keywords, multiple visual cues that emphasise a relationship to the play narrative and visually accentuated sequences of action. Repetition involved the children with similar play activities on more than one occasion. Repetition was necessary due to the learning difficulties of the children involved in this study.

The aim of Study Two was to assess whether either of the first two variables were significant in the success of the previous intervention. Study Two was in two parts, (a) and (b). In part (a) affect was removed from the intervention. In part (b) structure was

removed. Repetition was included in both parts of the study. Thus, the aims of the two parts of the study were:

- (a) To test the hypothesis that structure and repetition assist children with autism to improve their use of symbolic play skills.
- (b) To test the hypothesis that affect and repetition assist children with autism to improve their use of symbolic play skills.

Method for Study 2

Participants

Twelve children with autism participated in this study, none of whom had participated in Study 1. Six children were involved in the intervention group; six were in the comparison group. The children attended an autism specific unit in one of two special schools. The children in the intervention group attended the same school. The comparison group children attended a different special school. Both schools provided for children with moderate learning difficulties and made special provision for children with autism. All the children had learning difficulties in addition to autism. These children had statements of special educational need, which identified them as having autism and additional moderate or severe learning difficulties. All children met criteria in the Diagnostic and Statistical Manual - DSM IV (APA 1994) for autism. All the children in Study 2 were boys, consistent with the higher prevalence of boys with autism (4:1, Wing and Gould 1979). The comparison group children were individually paired with the children in the

intervention group for sex, verbal comprehension and educational attainment. All the children had verbal comprehension levels over twenty months as assessed on the Reynell Developmental language Scales (Reynell 1977). The children did not differ significantly in their verbal comprehension ($r = 0.99$). The children were aged between five and seven years in the intervention group and five and eight in the comparison group. All the children were assessed using the structured Verbal version of the Test of Pretend Play (Lewis and Boucher 1998).

The parents of the children in both groups gave permission for their children to be included in this study. Parents were informed about the nature of the study and were asked to continue normal routines at home. Teachers working with the comparison group were asked to continue the school curriculum as normal. This group do not normally receive any teaching on symbolic or social pretend play in school.

Pre-test Assessments:

Child code	RDLS	CA	TOPP
I1	20	5	4
I2	24	6	11
I3	30	7	7
I4	32	7	16
I5	42	7	14
I6	63	7	20

KEY to Table 2:1	
Child code	A code given to each child to protect anonymity.
RDLS	Reynell Developmental Language Scales, (Reynell. 1977) in months.
CA	Chronological age in months
TOPP	Test of Pretend Play . Lewis and Boucher. 1998 in months.

C1	22	7	2
C2	24	6	6
C3	28	8	4
C4	36	7	4
C5	48	7	10
C6	72	8	14

Table 2:1 Details of participants

Group	n		RDLS	CA	TOPP
Intervention Group	6	Mean	35	6.5	12
		Sd	15.6	0.84	5.9
		Range	43	2	16
Comparison Group	6	Mean	38	7	6.7
		Sd	19	0.75	4.5
		Range	50	2	12

Table 2:2 : Pre-intervention scores

Post-intervention assessments were carried out using the Free Play observation version of the Test of Pretend Play (Lewis and Boucher 1998). This was used to prevent distortion of the data by the over-use of the verbal version.

Procedure:

This author acted as the teacher with the Intervention Group. No play training or interventions were used with this group in the year prior to the research period. No play training or interventions were used with the Comparison Group, during the research period or in the year prior to it.

Study Two was performed in two parts, (a) and (b). Study 2 (a) used structure and repetition as independent variables in the development of pretend play. Affect was not included in this intervention, requiring the teacher to maintain a calm and unexcited approach. The comparison group was not exposed to pretend play interventions during this period or immediately prior to it. Study 2 (b) used affect and repetition as independent variables in the development of pretend play. Structure was not included, requiring the teacher to remove scripting, explicit instruction, prompting and elicitation. The comparison group was not exposed to pretend play interventions during this period or immediately prior to it.

The Intervention period lasted for four weeks. Within each week, the children in the intervention group were normally subject to the intervention for five, thirty-minute periods, a total of twenty sessions. Following the intervention period, the post intervention assessments were completed with both groups. The post intervention assessment used the Test of Pretend Play; Observation of Free Play.

Following this testing, the intervention group was introduced to the Study Two (b) intervention. This intervention attempted to replicate the conditions of part (a) and continued over twenty sessions in four weeks. This was followed again, by the post intervention assessments using the Test of Pretend Play; Observation of Free Play.

During Part (a) the six children sat in a circle in the classroom. The pretend play scenarios were briefly introduced by the teacher on all twenty occasions. Structure was introduced as the teacher modelled play scenarios and created a flexible script for the children to use. The teacher gave simple verbal cues to inform the children what was happening within the pretence and explicitly labelled some mental terms, e.g. “Sally-Dolly thinks that Dog is hiding”, or “Dog wants a sausage”. The modelled period lasted for five minutes. A low level of affect was used by the teacher on all these occasions. Following this the teacher asked a child to make up a story using the same materials. On some occasions the child chose another child to join him within the play. This was usually accepted at the discretion of the teacher. Each child was given up to three minutes with the materials. The final five minutes was used to review the procedure with the children.

During Part (b) the six children sat in a circle in the classroom. The pretend play scenarios were briefly modelled by the teacher on all twenty occasions. Structure was reduced in these sessions, as the teacher did not attempt to demonstrate a sequence of connecting ideas and focused on the interaction between the materials used. The teacher did not commentate on the play sequence or label the actions. A high level of affect was

used by the teacher on all these occasions. The modelled period lasted for approximately five minutes. Following this the teacher asked each child to play with the same materials. On some occasions the child chose other children to join in the play. This was usually accepted at the discretion of the teacher. Each child was given up to three minutes with the materials. The final five minutes was used to allow the children free time to with play the materials.

Materials :

Within these activities a wide variety of materials was used. Materials were chosen to facilitate the symbolic focus to each play session. These could be grouped as follows:

- A) Representational materials: puppets, teddies, cutlery and clothes, bandages, stethoscope, bag, Fymo gingerbread man, plastic goat, boat and food.
- B) Non-representational materials: cardboard boxes and tubes, paper, cloth, string, sticks, bags and plastic bottles.

Play Sessions :

The intervention for Study 2 (a) and (b) consisted of twenty play sessions. These were specified so that they could be replicated in both parts of the study. This enabled more reliable comparisons between the results following the interventions. The Symbolic function column in Table 2:3 identifies the primary symbolic aim. These have been specified to enable a better balance among the three functions listed. This is not intended to exclude the inclusion of the other symbolic functions.

Day	Story or activity reference	Symbolic functions
1	Three little pigs, 1 pig, 1 fox and various junk boxes.	Object substitution
2	Animal Hospital; poorly puppets.	Attribution
3	Fall off a boat; wet, dry, hot cold.	Attribution
4	There are ghosts in my bag.	Re/disappearance
5	The gingerbread man : junk materials for other characters.	Object substitution
6	This pencil is another object, what could it be ?	Object substitution
7	All the children in the class have disappeared, where ?	Re/disappearance
8	Clumsy crockery shopkeeper.	Object substitution
9	Icarus and the paper wings, hot, excitement, fear.	Attribution
10	Jack and the beanstalk, size, fear, anger.	Attribution
11	Inside Pandora's box, what can you find ?	Re/disappearance
12	Look at my picnic, lots of (junk) food.	Object substitution
13	Oh dear I've hurt my leg.	Attribution
14	Where did I put all my things; oh there they are.	Re/disappearance
15	We're going on a bear hunt.	Re/disappearance
16	The three billy goats gruff.	Object substitution
17	The selfish giant.	Object substitution
18	Pretending to be asleep, wake, very sleepy all day.	Attribution
19	Cooking food, hot, cold, delicious, unsavoury.	Attribution
20	Swimming underwater, what can you see ?	Re/disappearance

Table 2:3 : Symbolic Functions of Activities.

Play Coding :

The Observation of Free Play Schedule in the Test of Pretend Play, (op cit) enabled the coding of a fifteen minute, group free-play session within the following categories.

1. Self with everyday objects: while playing with everyday objects the child pretends that some imaginary object, substance or person is present (when this is not the case)
2. Toy and Non-representational Materials: the child substitutes 1, 2, 3 or 4 pieces or kinds of non-representational material in combination with a toy or everyday object.
3. Representational toy alone: the child makes a toy pretend that another person or object is present; attributes a pretend property to a toy; pretends that a toy is something or someone else; or makes a toy carry out a script of three related pretend actions.
4. Self Alone: the child pretends that a person or object is present; attributes a pretend property to himself; pretends to be something or someone else; or carries out a script of three related pretend actions involving himself.

These categories were accorded point scores. The sum of the points for each category resulted in a raw score. A comparison of the raw scores from Study 2 (a) and (b) could be made using these.

	Symbolic Function	Score for satisfying criteria within each item.	Maximum for category
1	Self with everyday objects	2	2
2	One substitution	2	8
	Two substitutions	4	
	Three substitutions	6	
	Four substitutions	8	
3	Toy makes reference to absent object	2	12
	Property attribution to toy	2	
	Substitution of toy for alternative	2	
	Scripted play with toy	6	
4	Child pretends to be something / one.	2	12
	Pretends that a person or object is present	2	
	Attributes property to himself.	2	
	Scripted play involving himself.	6	

Table 2:4 Play Coding

An independent rater coded two children in the intervention group video in the post intervention assessments for Study 2 (a) and (b). The independent rater also coded two children in the comparison group video for both periods. The children chosen were I1 and C1 and I6 and C6. These children had the highest and lowest language comprehension scores in the pre-intervention assessments. These pairs of children were chosen as they

were expected to have a large difference in their play abilities. The rater was given the category criteria in the Test of Pretend Play, (op cit.) Record Form and an explanation was given within the course of a trial coding. The inter-rater reliability comparing agreement was high. This gave Pearson correlations of 1 due to the small amount of data involved. Resulting test scores were analysed using an unrelated t-test.

A Critique of the Methodology:

The method had four flaws in the intervention design that affected the comparability of data. These seriously weakened an interpretation of the results. These problems and their resulting limitations are described below. Additionally, these may inform future intervention design.

- 1) The selection of the children was made initially on the basis of similar educational attainment, sex, chronological age and an assessment of verbal comprehension. Following this each child was tested for symbolic play ability using the structured Verbal version of the Test of Pretend Play (Lewis and Boucher 1998). The resulting mean pre-intervention scores for symbolic play were higher for the Intervention Group (12; s.d. 5.9), than the Comparison Group (6.7; s.d. 4.5). It was not then possible to make direct comparisons of post-intervention symbolic play between the two groups.
- 2) A second limitation was the use of the structured Verbal version of the Test of Pretend Play for Pre-intervention assessments and the use of the Observation of Free Play version for post-intervention assessments for Parts (a) and (b). This

prevented direct comparisons being made between pre and post-intervention symbolic play assessments.

- 3) The post-intervention assessments were taken from a single observation for each child, taken during the course of an afternoon. This ensured an equitable assessment but may have not enabled all the children an opportunity to be assessed on their optimal level of play.
- 4) The children in the Intervention Group may have had an advantage in Part (b) as they had previously received a structured intervention in Part (a). The post-intervention assessment for Part (b) may have been influenced by the previous intervention. In both of these interventions, repetition through the use of similar activities over a period of weeks was considered necessary. This prevented modifications to the order of the interventions.

However a comparison could still be made between the post-intervention assessment data from Parts (a) and (b) for the Intervention Group. A similar comparison could be made for the Comparison Group. The difference between the post-intervention scores for Part (a) could also be compared with those of Part (b). Any other comparisons would require caution in their interpretation. Future intervention design should ensure that the symbolic play skills of the children are given a greater prominence in the selection process. It was not possible to design the study to eliminate order effects, as alternating the intervention types (high-structure or high-affect) on a daily basis would not have allowed sufficient repetition. However it may have been possible to alternate intervention styles and assess the symbolic play of the children on a weekly basis. This would have also have provided

additional opportunities to assess the children in free play. Using a comparable pre and post-intervention assessment of symbolic play would have subsequently enabled the size of the order effect to be assessed.

Results

The raw score results are given in Table 2:5. These figures give the Total Raw Scores for each child in Study Two (a) and (b). The maximum total raw score for this assessment is 34 points. A score of zero shows that the child did not demonstrate the use of symbolic function within the play episode. The child may have used functional play or may not have used any pretend play at all. A total raw score of 34 would show that the child used a series of quite sophisticated symbolic play acts within the episode. Although Test of Pretend Play, (Lewis and Boucher 1998) is not standardised for the Observation of Free Play, it would be reasonable to imply that a score of 32 points would be exceptional for the children tested in this study.

Child code	Int. 2a (Ia)	Int. 2b (Ib)	Child code	Com. 2a (Ca)	Com. 2b (Cb)
I1	6	8	C1	2	2
I2	0	0	C2	4	4
I3	10	4	C3	4	6
I4	4	8	C4	2	2
I5	8	32	C5	10	8

I6	6	32	C6	8	10
Mean	5.7	14	Mean	5	5.3
s.d.	3.4	14.3	s.d.	3.3	3.3

Table 2:5 Study 2 ToPP Scores

Analysis of this data shows that the probability that the children in the Comparison group had made progress on symbolic play between observations taken at the end of study 2a and 2b was not significant ($t = 0.158$; $df = 10$). It is unlikely that the effects of maturation and normal development were responsible for the small rise in scores (Ca and Cb) over this short period. It is also unlikely that the increase in test scores (Ia and Ib) for the intervention group would be due to maturational increases.

An analysis of the post-intervention scores from the intervention group (Ia and Ib) compared the scores recorded after each intervention period. These scores showed a trend towards statistical significance, ($t = 1.404$; $df = 10$; $p < 0.1$ for a one tailed test).

Although this analysis gave some support to the argument that the high-affect intervention was more effective in producing symbolic play than the high-structure intervention, the results remain highly equivocal.

In the chart below, test scores between the structure variable (a) are compared with the affect variable (b).

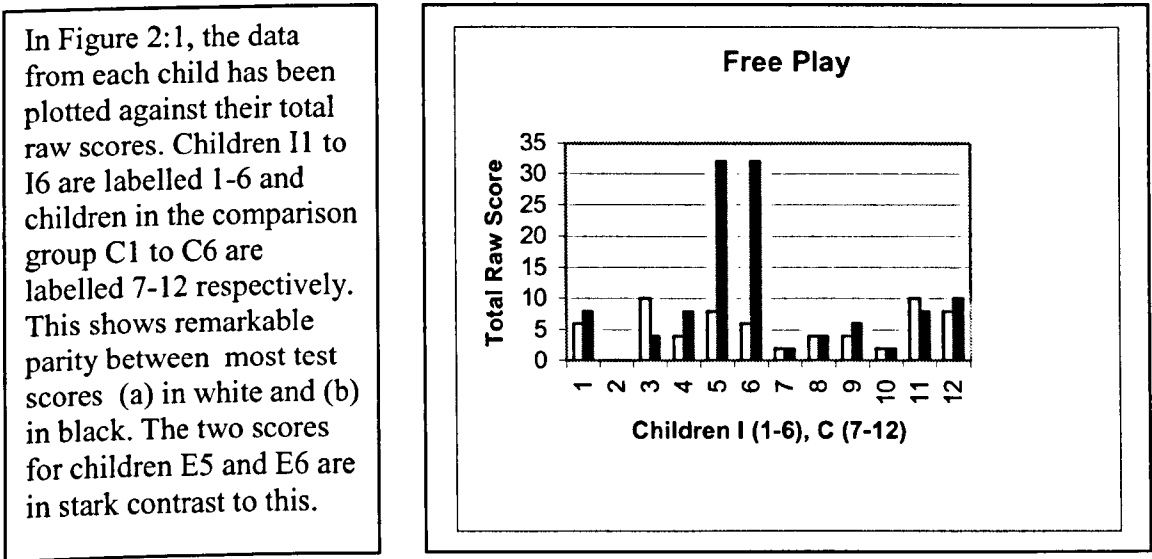


Figure 2:1 Study 2 Chart

The very high scores in children I5 and I6 were exceptional and warrant further exploration. These remarkably high results may have been the product of the high-affect intervention or of another variable. The evidence presented has not made this sufficiently clear.

Data from some of the play episodes (Appendix 3) could provide further evidence and clarification of this issue. The most notable example was taken from a play episode between the children I5 and I6 at the end of the high-affect intervention period. In this episode the children played together with two plasticine boats that they had made earlier. This spontaneous, social symbolic pretend play episode involved them in an unfolding drama about “Titanic”. The ships having avoided multiple icebergs, finished eating ice creams in dock. Another notable example involved child I3. In this he made up a bowl of soup using water and a rectangular fish tank (following a science lesson on floating and

sinking). The child used a tear-shaped plastic label and made this into a spoon. The child was able to describe this in different ways giving it different attributes and assisting another less able child to a helping of soup. A final example involved child I1, who spoke (with some reluctance) only in simple phrases and single words. Child I1 used a large roll of corrugated cardboard to be a pillar in a reconstruction of the death of Meg in the fight of the Titans. In this he asked an adult to be Hercules, whilst he lowered the cardboard onto his dying body. This level of representation was remarkable given the child's age and overall ability level.

In these three examples of spontaneous high-level symbolic pretend play, there are two factors that were not included in Study 2. The first of these is the social nature of interaction in the examples. The second factor is the interest level that the subject matter had for the children involved. In the first example, both children had a keen interest in vehicles. The "Titanic" had a particular fascination for both children and although they had not played at this before, both children had drawn pictures of the Titanic frequently in the weeks previous. In the second example, child I3 had played at hot and cold previously and had thought this very amusing. However this particular scenario was novel and spontaneous. In the third example, child I1 had used a favourite piece of video to form a brief narrative for this play episode.

The results from Study 2 suggest that structure and repetition alone are insufficient to produce an observable effect on the spontaneous play of these children with autism in a four-week intervention. The evidence gives some support to the use of high-affect in the

second intervention, however this alone seems unlikely to be sufficient. This notion is supported by the observation data; this suggests that social-play and personal-interest may be important variables.

Discussion

During both the intervention periods, the children were able to replicate similar scenarios immediately after the teacher model. However in the high-structure condition, intervention play episodes were not novel or spontaneous, nor were they high in symbolic representation. During the high affect intervention, the children responded and attended but were not particularly interested in the content of the play. Some children enjoyed the excitement but did not seem to develop it themselves.

In Study 1, structure and affect in addition to repetition were thought to be significant. However in Study 2, the evidence suggested that neither structure, nor affect is sufficient in itself to significantly raise the level of symbolic pretend play used by the children with autism. It may be the case that structure and affect are still effective in combination. However this seems an insufficient explanation of the results from Study 2. The children's interests and the initiation or involvement in social interaction may also have had a significant contribution in the development of the play of these children with autism. This may account for the remarkable results for two of the participants in the Intervention Group. It is also possible that the higher language levels of these two participants gave them an advantage in their readiness to play. They were perhaps more

ready to engage in play when the environmental conditions were appropriate. It may also have been important that the combination of a shared interest and the High Affect and Repetition condition contributed to these high levels of play.

Bruce (1991) writes that normally developing children operate at their highest levels of play when they are using first hand experience. This first hand experience can involve any meaningful experience in which the child was actively involved. Clearly taking subjects from a cartoon video (in the case of I1) or a film (in the case of I5 and I6) is not a primary first hand experience, but the videos of Hercules and Titanic were highly meaningful for those particular children. Play gives those children the opportunity to explore ideas and reflect upon these in an unrestricted manner.

There is a “critical mass” of contextual influences that may make the generation of creative pretence more likely (Bruce 1991). When the child uses their own interests to stimulate their play, it assists the child to pursue their own focused thoughts. Where this coincides with that of another player with a similar personal-interest, enhanced play may be possible. The child may then more easily understand at an emotional level why this is funny or sad or disappointing and the play may take on a new excitement and significance in learning. Following Study 2, the children in the Intervention Group found an identity on the school playground that had never been seen before. This involved all the boys involved in the experiment running round the field and playground with each other as a group. This occurred on most “break-time” occasions, during the final three weeks of the second intervention. This group behaviour was not evident with more than

any two children prior to Study 2 and was not evident in the Comparison Group children. It is possible that the children had started to engage in a shared understanding of play that had not existed previously.

Conclusion

In a comparison between the two conditions used by the Intervention Group, the symbolic play skills of the children trended towards statistical significance. However this was insufficient to adequately support the remarkable examples of play used to the some participants in the High Affect / Repetition condition. That these examples were shown by the participants was an important finding in itself. Methodological flaws in the selection of the Comparison Group prevented useful comparisons to be made between the Intervention and Comparison Groups.

The play development of children in social-play or personal-interest led situations may have had a relevance to some of these episodes. Future research should investigate the significance of social-play and personal-interests in the ability of children with autism to generate spontaneous symbolic play.



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Study 3

Introduction

Study 1 showed that the play intervention used was successful in eliciting symbolic play. Study 2 attempted to separate out the effects of affect and structure in making the intervention successful. For methodological reasons the roles of these two factors were not satisfactorily demonstrated. Study 2 also suggested an additional factor might be significant in enabling children with autism to spontaneously generate pretend play. The interest level of the children in the materials appeared to be important. The previous studies also suggested that consideration should also be given to the role of the researcher. The importance of the researcher to the success of the interventions used in Studies 1 and 2 was unclear and required investigation. Study 3 investigated again the role of a) affect and b) structure in making the intervention successful. Additionally Study 3 considered two further variables: c) interest in the materials and d) the researcher.

The twelve participants in this study were asked to use play materials under six conditions. These were high structure(HS), low structure (LS), high affect (HA), low affect (LA), high interest (HI) and low interest (LI). The play conditions were repeated by a second researcher. This study seeks to investigate which of these conditions would be most effective in enabling children with autism to spontaneously generate symbolic play.

Method

This study used six conditions. The order of presentation of these was sequentially alternated. Two researchers were used. Each researcher performed the study with all twelve participants. The researcher order was also alternated, to further reduce order effects. For each participant, the testing was completed during the course of a single day. Video recordings were made of all participants. The resulting data was rated for acts of symbolic play by one of the researchers (DS). In addition, a trained but independent and masked rater was used. The rater was masked to the aims of the study and to the conditions used. Video data of four participants was chosen at random and was analysed by the independent rater.

Participants

Twelve children from four different schools for children with learning difficulties and autism were tested. Participants ranged in age from 5:4 to 8:0, with a mean age of 6:11, and there were 10 boys and 2 girls. Participants were from families in a largely rural area of England, spoke English as their native language and were white. All children had a diagnosis of autism and were assessed as having autism shown on their statement of Special Educational Needs. In addition the researchers observed each child and interviewed school teaching staff to confirm that these assessments were correct. All children had a verbal comprehension level in the range from 1:11 to 5:4 (mean 3:5). Verbal comprehension was tested using PLS 3 - UK version (Lewis and Boucher 1998). All children had some expressive speech. The children were tested for symbolic play

skills immediately before testing using the Test of Pretend Play (Lewis and Boucher 1998). The children were tested on their non-verbal reasoning (British Ability Scale II, Early Years Battery). The mean of the two non-verbal tests was reported for each participant. All participants were within an age equivalent range of 2:6 to 7:8 (mean 5:4). All the participants were tested prior to the study and completed all six conditions.

Affect Conditions (high and low)

This condition investigated the role of affect on the performance of symbolic play used by the participants.

Materials

The materials used were two plastic doll figures (male and female), a plastic dog, a small wooden box, a piece of string (150 mm), a plastic bowl, a blue ribbon, two wooden blocks and a pencil sized wooden stick.

Procedure

The participants sat at a table in a quiet area within the school. The researcher sat opposite and placed the materials on the table. In the high affect condition (HA) the researchers appeared highly interested in the child's actions by looking intently at the toys and the participant. The researchers used encouraging sounds and phrases. The researchers looked pleased and comfortable with the child, throughout the condition. Acceptable words and phrases and affective expressions were used that were designed not lead the child in suggesting how the materials might be used and focused on the

child's behaviour. Questions that were designed to elucidate the child's thoughts were included. The phrases and expressions below were given as guidance. Accepted phrases included the following:

1. That's nice
2. Ooh lovely
3. That's really good
4. Wonderful, fantastic, excellent
5. Gosh ... that's scary, pretty, etc
6. Oh ?
7. Goodness me ...
8. What is that ?
9. Very good, that is a ... ? (asking for child's response)
10. A variety of sounds indicating the researcher's emotional engagement in the child's play.

The participants were allowed to play with the materials for a period of three minutes. The researcher returned the materials to the box.

In the low affect condition (LA) the researcher repeated the procedure but took no interest in the materials and showed no interest in the participants engagement with them.

The researchers looked away from the toys and used only minimal verbal responses. The researchers used other behaviours to demonstrate disinterest including looking at some papers or a wristwatch or gazing out of the window. The researchers attempted not to increase the excitement levels of the children by their own actions. Accepted phrases to maintain the participant's attention on the task included the following:

1. You play with these.
2. That's okay

The participants were allowed to play with the materials for a period of three minutes. The researcher again returned the materials to the box. The order of conditions was alternated between participants.

Structure Conditions (high and low)

This condition investigated the role of structure on the performance of symbolic play used by the participants.

Materials

The materials used were the generic play materials described above.

Procedure

The participants were asked to sit at a table in a quiet area within the school. The researcher sat opposite and placed the materials on the table. In the high structure condition (HS) the researcher described a story that involved the materials. The story used a script to provide parity between the two researchers and between participants. The story described the movements of the play materials in a straightforward and unexcited manner. A rough script was used as it needed to be adapted to the play of each child. The introduction was always the same and this is given below (a). After this introduction, participants were encouraged to introduce new and novel actions into the sequence using the phrases (b).

- a. The man and the lady go for a walk. They find a river ... and they get into a boat. There is something in the water.
- b. What is it... ? or What happens next ?

The participant was allowed to play with the materials for a period of three minutes. The researcher returned the materials to the box.

In the low structure condition (LS) the researcher repeated the procedure but remained quiet and showed no interest in the participant's engagement with the materials. Only simple phrases were used (as were used in the Low Affect condition) to redirect the

participant's attention if they became distracted from the task. The participant was allowed to play with the materials for a period of three minutes. The researcher again returned the materials to the box. The order of conditions was alternated between participants.

Interest Conditions (high and low)

These conditions investigated the role of the participant's interest in the materials on the performance of symbolic play.

Materials

In these conditions, additional play materials were used. "Fantasy" characters (a term borrowed from Lillard and Sobell, 1998) were used that were thought to interest the participant. The participant's interests were sought in a question asked of parents/carers prior to the study. Incorporated on the research permission slip, parents were asked which toy their child would prefer from a choice of five. These toys were an "Action Man" figure with moving arms and legs, a "Bob the Builder" truck, a "Tweenie" girl figure, a Thomas the tank engine and a soft plastic dinosaur (T-Rex type). In addition the generic play materials from the other conditions were used.

Procedure

The participants were asked to sit at a table in a quiet area within the school. The researcher sat opposite and placed the generic play materials on the table. The participant

was offered one of two additional toys. One of these was suggested by the participant's parents and the other was chosen at random. In the high interest condition (HI) the researcher watched the participant with the materials in an engaged and excited manner using affective signals such as those in (high affect). The participant was allowed to play with the materials for a period of three minutes. The researcher returned the materials to the box. In the low interest condition (LI) the researcher put the materials onto the table and remained disinterested as in the procedure for the Low Affect condition. The participant was allowed to play with the materials for a period of three minutes. The researcher again returned the materials to the box. The order of conditions was alternated between participants.

The order of the conditions was alternated to ensure that order effects were reduced. Participants were allocated an order of presentation, which was used by both researchers. This is shown in Table 3:1 below. To minimise the order effects the researchers also alternated so that participants with an even number were seen first by researcher DS and then seen by GD. Participants with an odd number were first seen by GD and then by DS.

Subjects	Order of conditions					
1	HS	LS	HA	LA	HI	LI
2	LS	HS	LA	HA	LI	HI
3	HA	LA	HI	LI	HS	LS

4	LA	HA	LI	HI	LS	HS
5	HI	LI	HS	LS	HA	LA
6	LI	HI	LS	HS	LA	HA
7	LI	HI	LA	HA	LS	HS
8	HI	LI	HA	LA	HS	LS
9	LS	HS	LI	HI	LA	HA
10	HS	LS	HI	LI	HA	LA
11	LA	HA	LS	HS	LI	HI
12	HA	LA	HS	LS	HI	LI

Table 3:1 Order of conditions

Results

Subjects	CA (y:m)	VMA	NVIQ	Key	
1	6:4	3:6	5:6	CA	Chronological Age
2	8:0	4:11	6:8	VMA	Verbal Mental Age
3	6:8	3:1	2:6	NVIQ	Non-verbal Intelligence
4	7:2	5:4	5:0		
5	6:6	3:3	7:6		
6	7:10	4:0	7:6		
7	7:2	2:6	4:4		
8	7:10	3:10	4:6		

9	5:09	1:11	5:0
10	5:4	2:6	3:10
11	7:6	4:11	7:8
12	7:1	2:0	4:0
Means	6:11	3:5	5:4

Table 3:2 Initial scores

The results taken from the data analysis of researcher GD is given in Table 3:3.

subjects	HS	LS	HA	LA	HI	LI
1	1	0	1	0	3	0
2	16	3	8	2	5	1
3	0	0	0	0	0	0
4	6	0	8	1	4	0
5	10	10	2	0	6	1
6	8	4	7	4	3	0
7	7	7	9	5	6	4
8	11	3	7	4	5	7
9	3	1	4	0	2	0
10	4	0	5	1	2	0
11	5	3	4	0	0	0
12	1	0	2	0	1	0
Totals	73	31	57	14	34	13

Table 3:3 Data analysis (GD)

The results taken from the data analysis of researcher DS is given in Table 3:4.

subjects	HS	LS	HA	LA	HI	LI
1	5	0	0	0	3	1
2	11	2	9	3	5	1
3	1	0	0	0	0	0
4	8	0	9	4	5	3
5	5	0	0	1	0	0
6	6	0	9	7	9	5
7	6	6	14	9	7	1
8	2	0	9	2	11	6
9	4	1	3	0	2	0
10	3	1	4	0	1	0
11	6	2	5	2	3	1
12	1	1	2	1	1	0
Totals	58	13	64	29	47	18

Table 3:4 Data analysis (DS)

Video data of two participants, each involved in one condition were chosen at random from the data from each researcher and these were analysed by an independent rater. The scores from the two raters were compared and were found to be similar. This resulted in a correlation coefficient of 0.93

An unrelated t-test was used to compare the variability in the total scores of each condition for the two researchers. This showed that there was no significant difference between the two researchers in the variability of the scores ($p > 0.2$).

Analysis was undertaken using a two-tailed, related t-test to examine the variability of scores for the participants under high and low conditions of structure, affect and interest. These were all highly significant for: Structure $t = 4.78$, $df = 11$, $p < 0.001$; Affect $t = 5.09$, $df = 11$, $p < 0.001$; Interest $t = 4.96$, $df = 11$, $p < 0.001$. Thus the participants were more likely to produce symbolic play acts under the high intervention conditions.

The data was analysed to find if there were any significant difference between the high intervention scores (HS, HA, HI). A related, one-way Analysis of Variance was used to find any differences that might indicate that some of these were more effective than the others (Table 3:5).

Sources of variance	Sums of Squares	Degrees of freedom	Mean Squares	F Ratio
Conditions	100.73	2	50.37	$F_{2,22} = 0.25$
Subjects	5352.23	11	278.34	
Error	4439.73	22	201.81	
Total	1013.23	35		

Table 3:5 Difference between the high intervention scores

The results from this analysis show that the three high intervention conditions were not significantly different ($p < 0.05$). Although the mean scores for these high interventions were different: Structure 10.8, $sd = 6.98$; Affect 9.91, $sd = 7.28$; Interest 6.91, $sd = 4.87$ this was insufficient to show a statistical significance.

Time samples were taken from the High Interest Condition to look at the quality of play when the fantasy toy was introduced. The following six subjects were chosen at random from the high interest condition from either researcher. The participant's behaviour with the materials was described every 30 seconds.

Subjects	Toy	Researcher
1		
2		
3	Thomas the Tank Engine Train	DS
4	Pokemon	DS
5	"Muck" bulldozer truck from TV.	DS
6		
7	Thomas the Tank Engine Train	DS
8		
9	Thomas the Tank Engine Train	GD
10		
11		

Table 3:7 List of randomly chosen participants in the High Interest condition.

The following observations were taken in 30 second time samples for the 3 minutes of the high interest condition.

Time	Subject 3
0.30	Pushed train; drove the train around the objects
1.00	Pushed train round the objects in a large circle
1.30	Pushed train faster and faster round the table and then slowed down
2.00	Train is very slow and then stopped; subject looked at the train
2.30	Subject looked at the train
3.00	Subject looked at the ceiling

Time	Subject 12
0.30	Subject held the dinosaur by its tail and said "Wah".
1.00	Put dinosaur on the table; looked at the dinosaur
1.30	Subject pushed the dinosaur towards the researcher
2.00	Subject talked about something unrelated
2.30	Subject pushed the dinosaur towards the researcher
3.00	Dinosaur stood on a block; subject put the dinosaur under the table; put the dinosaur back on the table said, "dinosaur fall".

Time	Subject 4
0.30	Wrapped string and ribbon around the man.
1.00	Wrapped ribbon around the man.
1.30	Wrapped string around her finger and the man.
2.00	Wrapped string around the man; Pokemon touched the woman who was stood next to the man.
2.30	Woman was made to stand on the Pokemon.
3.00	Woman fell off the Pokemon and sat on the dog.

Time	Subject 5
0.30	Pushed the truck round in a circle; played with the truck wheels.
1.00	Played with the dumper bucket.
1.30	Subject pushed the truck round the table.
2.00	Subject pushed the truck round the table.
2.30	Subject played with the dumper bucket.
3.00	Subject played with the dumper bucket.

Time	Subject 9
0.30	Subject held the train on the table; pushed it a little on the table.
1.00	Subject pushed it a little more on the table; held very closely to one eye.
1.30	Subject pushed the train on the table.
2.00	The train got tangled with the string.

- 2.30 Subject put his head near the table and pushed the train so that its wheels moved backwards and forwards in front of his eyes.
- 3.00 Subject pushed the train over the string and made noises.

Time	Subject 7
0.30	Subject pushed the train to a block, which he called a “station”; pushed the train to the ribbon which he called a “pond”.
1.00	Rolled the train over and over on the ribbon.
1.30	Knocked over the man which fell into the “pond”.
2.00	Put the train on a block said “skyscraper”.
2.30	Played with stick.
3.00	Pushed the train with the stick; the train ran into the dog; the dog bit the train.

Table 3:8 Results of six participants in the High Interest condition.

Discussion

The results supported the hypothesis that structure, affect and interest were important variables in the elicitation of symbolic play skills in children with autism. In the high intervention conditions, the participants in this study showed considerably higher use of symbolism in their play. This was contrasted with the low use of symbolic play in the low intervention conditions (low structure, low affect and low interest). Although the mean score for the high structure condition was higher than the others this was not significantly so and indeed the mean score for the high affect condition was at a similar level to the

high structure, ($t = 0.95$, $p > 0.2$, $df = 11$). This study aimed to clarify which of these variables was significant in eliciting symbolic play in children with autism. Previous literature had suggested that structure was important in this (Lewis and Boucher 1988). The results did not support a clear advantage to structure over affect in the elicitation of symbolic play. Are they both important in eliciting symbolism in play ?

Could the high structure and high affect conditions which appear highly contrasting both be offering a critical component that is advantageous to these children ? These ideas are discussed further in Chapter 8.

Although the high interest condition was successful in eliciting symbolic acts in the play of the participants, it was also not as successful as the high affect and high structure conditions. Why was this the case, the high interest condition used the high affect procedure with the addition of an attractive toy ? Is it possible that this toy was responsible for lowering the level of symbolic play from that of the high affect condition? A possible explanation lies in examining the video data and in particular looking in detail at the response of the participants in the high interest condition (Table 3:8). These showed the attention of each child was almost entirely on the “high interest” toy that was introduced in this condition. Rather than playing symbolically with these new toys the children used them in a highly repetitive way and used either functional play or details of the object for sensory stimulation. The dominating effect of these toys may have offset the positive effects of the high affect condition that accompanied the “high interest” toy. Data analysis of the scores for all participants in the high affect and high interest

conditions showed that there was a significant difference between them $t = 2.28$, $p < 0.05$, $df = 11$. Whereas a similar analysis of the high affect and high structure conditions resulted in no significant difference $t = 0.95$, $p > 0.2$, $df = 11$. This supports the suggestion that the high interest toys decreased the positive effects of the high affect context for this condition.

The role of the researcher was also tested in this study and the results showed that the difference between the scores were not of significance ($t = 0.09$, $p > 0.2$, $df = 10$). However, both experimenters were colleagues from the same research group and had been trained to replicate the conditions closely. The results then question the extent of the difference between researchers and caution should be shown in the generalisability. This result showed that the success in eliciting symbolic play acts in these participants was unlikely to be due to the non-transferable skills of one researcher but could be replicated by others.

Conclusion

The study showed that symbolic play acts could be elicited in the participants using high structure and high affect conditions. The use of high interest toys was less likely to elicit symbolic acts in these participants. The number of symbolic acts used by the participants were not unduly influenced by the replication of the conditions by a second researcher.



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Study 4

Introduction

In Study 3, the participants were given play materials and encouraged to use them under six conditions. Study 3 further investigated the role of affect, structure and interest in the materials. Study 3 sought to investigate which of these conditions was most effective in enabling the participants to spontaneously generate symbolic play.

Study 4 repeated the two most successful conditions under Study 3. Rather than assessing the symbolic play of the participants, Study 4 attempted to investigate whether the social communicative responses of the participants were different under different settings. This required the children with autism to be compared with children that did not have autism. Four children with autism and learning difficulties were matched with four children who had learning difficulties but who did not have autism. The participants were matched on verbal comprehension. All of the children were primary aged, all were male and from a white ethnic background. The participants were selected from three special schools in the north of England.

Method

This study used three conditions. The order of presentation of these was sequentially alternated. For each participant, the testing was completed during the course of a single day. Video recordings were made of all participants. The resulting data was rated for

behaviours of social-communicative behaviour by the researcher. In addition, a trained but independent and masked rater was used. The rater was masked to the aims of the study and to the conditions used. Video data of two participants was analysed by the independent rater.

Participants

Eight children from three different schools for children with learning difficulties and autism were tested. Participants with autism ranged in age from 5:8 to 7:5, with a mean age of 6:6. Participants with learning difficulties but no autism ranged in age from 4:11 to 7:6, with a mean age of 6:2. Participants were from families in a largely rural area of England and spoke English as their native language. The children in the group with autism all had a diagnosis of autism and were assessed as having autism shown on their statement of Special Educational Needs. In addition the researchers observed each child and interviewed school teaching staff to confirm that these assessments were correct. All the children with autism had a verbal comprehension level in the range from 1:11 to 4:11 (mean 3:6). All participants with learning difficulties but no autism had a verbal comprehension level in the range from 2:0 to 4:10 (mean 3:6). Verbal comprehension was tested using PLS 3 - UK version (Lewis and Boucher 1998). All children had some expressive speech.

Materials

The materials used in all conditions were the same as the generic materials used in Study 3 and consisted of two plastic doll figures (male and female), a plastic dog, a small

wooden box, a piece of string (150 mm), a plastic bowl, a blue ribbon, two wooden blocks and a pencil sized wooden stick.

Affect Condition

This condition investigated the role of affect on the social-communicative behaviour used by the participants.

Procedure

The participants sat at a table in a quiet area within the school. The researcher sat opposite and placed the materials on the table. The researcher demonstrated enthusiastic interest in the materials and showed an exaggerated interest in the participant's engagement with them. Guidance on behaviours of affect and acceptable phrases were the same as those used in Study 3. The participant was allowed to play with the materials for a period of three minutes. The researcher returned the materials to the box. The order of conditions was alternated between participants.

Structure Condition

This condition investigated the role of structure on the social-communicative behaviour used by the participants.

Procedure

The participants sat at a table in a quiet area within the school. The researcher sat opposite and placed the materials on the table. The researcher described a story that involved the materials. This story used the script from Study 3. The story described the movements of the play materials in a straightforward and unexcited manner. The participant was allowed to play with the materials for a period of three minutes. The researcher returned the materials to the box.

Low Intervention Condition

This condition investigated the effect of a low intervention on the social-communicative behaviour used by the participants. The procedure for these was described in Study 3, (Low Affect condition).

Procedure

The participants sat at a table in a quiet area within the school. The researcher sat opposite and placed the materials on the table. To begin the condition the participant was asked to play with the materials. For a period of three minutes the researcher made minimal responses to the child's questions and did not attempt to guide or prompt the child to play. The researcher picked up some papers and attempted to look otherwise occupied. The researcher then returned the materials to the box.

The order of the conditions was alternated to ensure that order effects were reduced.

Participants were allocated an order of presentation, which was used by both researchers.

This is shown in Table 4:1 below.

Subjects	Order of conditions		
1 and A	HS	LI	HA
2 and B	HA	LI	HS
3 and C	HS	LI	HA
4 and D	HA	LI	HS

Table 4:1 Order of conditions for participants with autism (1-4) and without autism (A-D).

The criteria for coding the socio-communicative behaviours of the participants are given in Table 4:2. The video was analysed against these criteria. Additionally two participants were assessed by an independent rater. The independent rater was masked to the aims of the study and to the conditions used.

The video data was coded using the following criteria.

Asocial smile or laugh The participant smiles or laughs to themselves or to the toy or play materials. The participant must not look towards the face of the researcher within a period of 3 seconds before or after the beginning or end of the smile or laugh. A smile or laugh may be momentary or last for several seconds.

Asocial vocalisation	<p>The participant speaks or vocalises to themselves or to the toy or play materials. This vocalisation should have some meaningful referent and an incidental cough is insufficient. The participant must not look towards the face of the researcher within a period of 3 seconds before or after the beginning or end of their vocalisation. A vocalisation may range from a sound to several sentences within an episode.</p>
Social smile or laugh	<p>The participant smiles or laughs with reference to the researcher. The participant may smile or laugh in response to their own actions or thoughts, the actions or speech or the tester or to initiate a response from the tester. Where this intention is not obvious the child should look towards the face of the researcher within a period of 3 seconds before or after the beginning or end of the smile or laugh. A smile or laugh may be momentary or last for several seconds.</p>
Social vocalisation	<p>The participant speaks or vocalises with reference to the tester. This vocalisation should have some meaningful referent and an incidental cough is insufficient. The participant may speak or vocalises in response to their own actions or thoughts, the actions or speech or the researcher or to initiate a response from the researcher. Where this intention is not obvious the participant must look towards the face of the researcher within a period of 3 seconds before or after the beginning or end of their</p>

vocalisation. A vocalisation may range from a sound to several sentences within an episode.

Eye contact The participant should move their eyes towards the eyes of the researcher to see where the researcher is looking or to re-engage the researcher in the behaviour of the participant. This may last very briefly or for several seconds.

Table 4:2 Criteria used for coding social communicative behaviour.

Results

Subjects with autism	Age (y:m)	VMA (y:m)	Subjects without autism	Age (y:m)	VMA (y:m)
1	7:0	4:11	A	7:6	4:10
2	5:8	3:10	B	6:8	3:10
3	6:1	1:11	C	4:11	2:0
4	7:5	3:3	D	7:2	3:4
Means	6:6	3:6	Means	6:2	3:6

Table 4:3 Participants were matched for age, sex and verbal comprehension (VMA).

The video was coded using the criteria in Table 4:2. The results from the video analysis for children with autism is given in Table 4:4 and children who did not have autism in Table 4:5.

High Structure Condition					
Subjects	Smiles or laughs to self	Vocalises to self or object	Smiles or laughs with other	Vocalises to other	Makes eye contact
1	0	9	1	6	1
2	1	3	1	4	3
3	0	6	0	9	9
4	0	1	0	20	1
Totals	1	19	2	39	14
High Affect Condition					
1	0	6	6	12	3
2	0	4	0	4	5
3	1	1	7	4	4
4	0	0	1	2	3
Totals	1	11	14	22	15
Low Intervention Condition					
1	0	27	1	0	0
2	2	2	0	0	0
3	2	0	0	0	1
4	2	5	0	1	0
Totals	6	34	1	1	1

Table 4:4 Scores - children with autism.

High Structure Condition					
Subjects	Smiles or laughs to self	Vocalises to self or object	Smiles or laughs with other	Vocalises to other	Makes eye contact
A	0	4	0	11	10
B	0	2	11	17	26
C	0	4	6	7	6
D	0	7	2	16	13
Totals	0	17	19	51	55
High Affect Condition					
A	0	2	0	11	6
B	0	0	16	3	16
C	1	0	4	13	4
D	0	0	12	23	43
Totals	1	2	32	50	69
Low Intervention Condition					
A	1	4	0	8	8
B	1	1	9	14	16
C	3	4	5	7	17
D	1	1	2	1	16
Totals	6	10	16	30	57

Table 4:5 Scores - children who did not have autism.

Discussion

In Table 4:6, the number of behaviours that were asocial (vocalises to self and smiles or laughs to self) was compared with those of the social behaviours (vocalises to other and smiles or laughs to other). The contrast between the results when grouped in this way is notable. The percentage of asocial and social results is also given.

Table 4:6 A comparison of asocial and social behaviours.

Children with autism	Asocial	Social	% Asocial	% Social
High Structure	20	41	32.7	67.2
High Affect	12	36	25	75
Low Intervention	40	2	95.2	4.7
Children with learning difficulties	Asocial	Social	% Asocial	% Social
High Structure	17	70	19.5	80.5
High Affect	3	82	3.5	96.5
Low Intervention	16	46	25.8	74.2

Table 4:6 A comparison of asocial and social behaviours.

The total number of asocial responses for children with autism is the low power condition

Video data of two participants were chosen at random from the data from each researcher and these were analysed by an independent rater. The scores from both raters were compared. The agreement between raters was good with a correlation coefficient of 0.9 . An unrelated t-test was used to compare the variability in the total scores of each condition for the two researchers. This showed that there was no significant difference between them in the variability of the scores ($p > 0.2$).

Discussion

The results of Study 4 provide interesting information on the socio-communicative responses of children with autism and matched children with learning difficulties. 4:6 shows a remarkably high figure for asocial behaviours in the low intervention condition for children with autism when compared with the social behaviours. This remains remarkable when the autism-asocial result is compared with the asocial figures for children who did not have autism. In both high intervention conditions for children with autism the number of uses of eye-gaze was far lower than the number of social vocalisations. In the comparison group, children with learning difficulties had very similar figures for eye contact and social vocalisations. The number of social and asocial behaviours was higher for the children with learning difficulties on each condition. The autism group showed high levels of vocalisation in the high structure condition and more smiling and laughing in the high affect condition. Each of these results needs examining in order to suggest how they relate to each other.

The total number of asocial responses for children with autism in the low intervention condition was 40 (95.2%). This compares with the 2 (4.7%) of social responses in this condition. The children appeared more able to maintain an asocial narrative and on occasions the children talked and smiled at the toys or ideas they were playing with. The children with learning difficulties in contrast scored 16 (25.8%) for asocial responses and 46 (74.2%) for social responses. In short, the proportion of asocial responses in the low intervention condition was very high for children with autism. In contrast, children with

learning difficulties but no autism initiated far higher number of smiles and vocalisations towards the tester, despite the conspicuous lack of adult engagement.

Similarly, the children with learning difficulties in the low intervention condition responded with a high number of moments of eye contact (57), whereas the children with autism only scored 1 attempt at eye contact when the adult was not engaged with the play. This may have implications for the use of play as a medium to learn about others in free-play and normalised, integrated settings for children with autism. The number of eye movements towards the researcher by the children with learning difficulties in the low intervention condition was very similar to the results for eye contact in the high intervention conditions. This again is in marked contrast to the results from the children with autism. This may support the notion that eye direction is an important difference between children with autism and relatively normally developing children or at least those with learning difficulties.

An interesting addition to this is the result that the children with learning difficulties provided social behaviours far more frequently in either the high or low interventions than the children with autism. It is possible that children with autism are not as able to generate external or internal responses to the social cues in the environment if there is not a highly intensive cueing process in operation.

In the autism group, the high structure condition shows a high figure for vocalises with other. This is probably due to the use of questions within the structure. The researcher

asks on many occasions, "...and what happens next ? or ... and then the lady ... ?" This is both a temporal and linguistic prompt. The participants show a high number of verbal responses to the spoken questions from the tester. Although the number of social behaviours is similar between the high intervention conditions, the number of vocalisations and linguistic behaviours is higher in the high structure condition. The number of smiles and laughs shared with the researcher is higher in the high affect condition. This supports the idea that the high structure condition may have engaged the children within an interactive linguistic framework. Many of these linguistic responses did not reflect the child's understanding of the situation and often reflected the need to respond to a verbal question with a verbal response e.g. Researcher, "What is that ?" Participant, "a stick" giving a literal response rather than referring to a symbolic representation. This may have used superficial rather than full cognitive processing. In contrast, the high affect condition elicited high levels of smiles and laughter that were shared between the individuals.

In summary, the children with autism were more likely to engage with the adult in play in the high intervention conditions. Where these conditions involved the researcher asking spoken questions, the participant's response was more likely to have a high level of socially directed vocalisations and speech. Where the researcher's response involved a high degree of interest in the child's actions, sometimes stimulating excitement, the child is more likely to respond by looking towards the researcher and sharing a smile or a laugh. When the researcher was not trying to engage the participant, the children with

autism quickly involved themselves in asocial activity and displayed low levels of socio-communicative intent.

The children with learning difficulties were more likely to generate socio-communicative behaviours in either high or low intervention conditions and would initiate social behaviours towards the researcher even when the adult was making minimal responses in return. The children with learning difficulties were more likely to use socially directed eye movements as an important part of this, although speech initiation may also have been used to demonstrate social relatedness.

The results of Study 4 suggest that the level and type of intervention may be important in maintaining high levels of social engagement with participants in the group with autism. Both high interventions resulted in higher levels of engagement in the interactive process and this may have important implications for the teaching of children with autism.

Conclusion

This study compared the social-communicative behaviours of children with autism and those with learning difficulties to three conditions. These conditions were two high intervention conditions (high structure and high affect) and a low intervention condition. The children with autism responded with high levels of speech towards the researcher in the high structure condition. In the high affect condition, the children with autism responded not with high levels of speech but showed high levels of smiling and laughing.

The frequency of the child looking at the eyes of the researcher in both these high intervention conditions were similar. In the low intervention condition, the children with autism showed very low levels of engagement using speech, vocalisation, smiling, laughing or use of eye-gaze.

The results of this autism group were compared with matched children who had learning difficulties but did not have autism. These children displayed high levels of socially directed behaviour in the low intervention condition as they had done in the high intervention conditions.

Discussion

Substantial evidence has been found that children with autism have difficulties in developing pretend play and in particular spontaneous, symbolic play. In this thesis children with autism were shown to demonstrate symbolic play under particular conditions. As an impairment in pretend play is common amongst children with autism, this finding is in itself significant. Yet what does this study of pretend play in children with autism have to contribute to our existing understanding of play in autism; how can the results of studies 1-4 be interpreted in light of the literature and to what extent can these findings be generalised to a wider population? What do the results of this study have to contribute to the practical and theoretical implications of structure as a teaching approach? These questions and additional issues of methodology are discussed. Finally, suggestions are given for future research opportunities that are based on the results of this study. This discussion begins with a summary of the main findings from each study.

Summary of the Main Findings

Study 1 was successful in demonstrating that children with autism were able to use symbolic play in structured settings. During this some children began to generate spontaneous play and to create novel narratives with others. In Study 2, structure and affect were the key variables. The results showed that under either variable the participants were able to engage in pretend play. Once again several children were able to generate spontaneous play in interactive settings, usually with their peers. Study 3 was able to test children with autism under high or low structure, high or low affect and high or low interest conditions. The results gave support for the argument

that structure was successful in allowing children with autism to use pretend play. Yet the results also showed that affect was highly significant. Were these successful for the same reasons ? Was the intensity of the intervention itself the most important factor in this success ? Some support for this came from the high interest condition that also showed a significant level of play, even though this was lower than in the other conditions. However it may also be true that the structure and affect conditions were successful in different ways ? Perhaps the quality of the play was different under these conditions. Study 4 provided information on the type of behaviour that occurred in children with autism during the high structure and affect conditions. This supported the view that children with autism used more socially regulated smiling and laughing behaviours under the high affect condition, whereas in the high structure condition their behaviour showed a high frequency of socially regulated speech. This provided some interesting detail on the efficacy question of whether structure or affect was more successful in eliciting symbolic play in children with autism. Study 3 showed that the children with autism, found great difficulty in generating symbolic play without an intensive intervention. In Study 4, the children with autism also showed that they generated extremely low levels of socio-communicative behaviours when the researcher appeared uninterested. In contrast, children with learning difficulties without autism made frequent attempts to repair the lost connection with the adult. Questions emanating from these points are discussed in light of the literature on the development of pretend play in children with autism.

Descriptions of Three Similar Studies in the Literature

Although these results are exceptional within research on pretend play in children with autism they sit somewhat on the outside of the established literature on this

subject. There are few studies that attempt to investigate the development of symbolic play in children with autism. The Literature Review highlighted three practitioner studies that are relevant to this thesis. It also examined the performance, social and competence arguments that have been used to explain a play impairment in children with autism. These will be considered and their relation to the results of studies 1-4 examined.

Thomas and Smith (2004) used modelled play in imitation to teach a play based narrative. All 3 participants showed improvement in play skills. The quantity and quality of play produced by participants in Studies 1 and 2 was considerably higher than those in Thomas and Smith. Possibly, the reason for this difference may be caused by a lower mean verbal comprehension level amongst the Thomas and Smith group (no VMA or MA levels were given, although one subject was described as being verbal). It is also possible that the difference was due to the greater time of the intervention in Studies 1 and 2. In Thomas and Smith, this amounted to 50 minutes over two weeks. Studies 1 provided 1800 minutes over 15 weeks. Study 2 used 600 minutes in each of two, four week interventions. Clearly it is difficult to compare the intervention periods of Studies 1 and 2 with Thomas and Smith. However, although a very different procedure was used, Study 3 did use very short intervention periods of only three minutes for each condition and showed a production of symbolic play acts far in excess of Thomas and Smith. As Thomas and Smith used a small sample size of 3 children and no control or comparison group it has similar difficulties to Study 1 and 2 in generalising to a wider autism population.

Thorp, Stahmer and Schreibman (1995) examined the effects of sociodramatic play training on 3 subjects. Once again, the small size of the sample makes it difficult to generalise to a wider population. The participants had a mean age of 92 months. This is slightly higher than the participants in Study 1 (64 months) and Study 2 (78 months). The participants had a mean expressive language level of 4:1. Receptive language levels were not reported. This makes a comparison difficult as Studies 1 and 2 assessed verbal comprehension and not expressive language levels. However the mean verbal comprehension levels for Studies 1 and 2 were 2:3 and 2:11 respectively. It seems probable that the language levels reported in the Thorp, Stahmer and Schreibman study were considerably higher than the participants in Studies 1 and 2. If the recorded language levels are calculated as a proportion of the chronological age, then the participants in Thorp, Stahmer and Schreibman are probably more linguistically able (0.53) than those in Study 1 (0.42) and Study 2 (0.45). Comparisons are made more difficult as Thorp, Stahmer and Schreibman coded their resulting data as a percentage of time using sociodramatic play behaviours. The participants all made gains in all aspects of sociodramatic play. One of the criteria was symbolic play (substitution and imaginative disappearance, but not attribution of false properties) and all participants increased their use of symbolic play. As the results were presented in graphical form it is not clear exactly how large these increases were. However the study also showed that the positive results of the sociodramatic training were not due to single researcher, as other teachers were involved in implementing the intervention. In Study 3, a similar result was found.

Wolfberg and Schuler (1993) evaluated an intervention with three subjects, aged approximately eight years, during a research period covered 720 minutes over 7 months. This time period was most similar to Study 2.

No standardised tests were used to assess the language levels of the participants. The descriptions of the language used by the participants is insufficient to make accurate judgements about language levels, but two of Wolfberg and Schuler's subjects were probably similar to the participants in Study 1 with the three lowest language levels and the two participants in Study 2 with the lowest language levels. This would tentatively indicate that at least two of Wolfberg and Schuler's subjects might be capable of symbolic play. It is difficult to establish whether this is the case as Wolfberg and Schuler do not differentiate between functional and symbolic play in the results and use the term "symbolic play" in a wider sense than it is used in this thesis. However even in this wider classification, there was little evidence of symbolic play.

Wolfberg and Schuler's study did not examine the type of symbolic transformations used by the participants and were coded only for symbolic/pretend play. It is not clear that the participants used generative and novel symbolic acts or in imitated acts of pretence. The high level of modelling by the expert players and the propensity of some children with autism to imitate the behaviour of others without a symbolic understanding of it suggests that this may be the case. The use of echolalia by two of the three participants provides an example of this type of imitative behaviour.

The functional/ symbolic play results from Probe II for (two of the participants) Jonah and Craig may be skewed by a small sample size. Craig also showed erratic scores in the three observations of Probe I for functional / symbolic play (approximately 80%, 0% and 0% respectively) and this may be due to the small sample size. However, this seems an insufficient explanation and some qualitative description of the play of these participants would have supported the quantitative analysis and provided a clearer explanation of what was happening.

Craig also was observed to be using functional play approximately 60% of the time in the week 9 baseline sample. Although it is difficult to be accurate in reading these graphs, a score of 60% would be roughly equivalent to the mean scores for Intervention I and Probe I. It may be that the reasons for Craig's success in Probe II were due to greater cognitive capabilities and that these were built on through the intervention. There was insufficient information on the cognitive capabilities of the participants in this report.

Metarepresentation and Pretence : findings from the present study

The metarepresentational hypothesis is based on the premise that pretence is metarepresentational and that this is required for children to understand and to use pretence in their play. If children with autism are impaired or delayed in their acquisition of this capability then it follows that their ability to pretend will also be impaired (Leslie 1987; Baron-Cohen 1987). Metarepresentations are required to represent the medium of pretend within the child's mind. The child is required to be able to recognise that they are pretending or that another is pretending. Without this metarepresentation the child may be confused by a counter-factual image and would

dismiss this. In enacting an object substitution the child must acknowledge to himself (and preferably to others) that the symbol is not real and therefore to use this he must have an implicit metarepresentational ability. Whilst it may not be necessary for the child to use metarepresentations within symbolic play, it is possible to say that the child is using an implicit metarepresentation where they enact the signifier in a way that cannot be understood without reference to an awareness of operating from a non-literal stance. Leslie (1987) in particular suggested that a metarepresentational deficit was the causal mechanism that resulted in the symbolic play impairment found in children with autism. It is clear from the results of the studies reported in this thesis that whether this process is truly metarepresentational or due to a relatively simple representational decoupling of reality (Perner 1991) and a partitioned or ring fenced pretence, that the participants of these studies were able to learn how to use pretence and some of these children learned to enjoy this in social groups. In Studies 1 and 2 the children had sufficient time to develop independent play skills that became generalised and spontaneous. In Studies 3 and 4 the children were able to demonstrate their symbolic play with no training or teaching.

A metarepresentational stance on this question might consider the progress that the children made in the studies to lack validity and to be due to learnt responses to the researchers requests. The rational, systematizing (Baron-Cohen 2003) brain of many children with autism may have used the structures described in the studies to bypass the need to examine the counter-factual (or metarepresentational) question mark in their own minds and to move on to the instruction of the researcher. In this way it could be said that these children are not pretending but simply following instructions. De Clercq (2003) the mother of a boy with autism, describes the non-autistic world as

being surreal as it does not rely on the concrete but through the hyper-realist eyes of a person with autism appears to give importance to quite random features. In such a surrealist world, following instructions by others that are not based on a personal understanding of reality may be a common occurrence. However leading a child through a world of pretence that they do not understand is not the same as the child experiencing pretence as an intentional state themselves. Some of the examples taken from all four studies show what appears to be real engagement and pleasure in the pretence from the children with autism. Some of the children also showed novel acts of pretence, which would be difficult to produce without some meaningful engagement with the play process. This evidence is not compatible with the metarepresentational account, in that these children with autism who had language levels compatible with the onset of symbolic play in normally developing children were shown to use symbolic play. This suggests that children with autism either have a metarepresentational deficit but this is not required in pretence, that metarepresentations are not involved in pretence or that in a structured setting some children with autism can elicit and in the longer term, learn to play symbolically. These results then swing an emphasis that was established in the literature from the consideration of a representational impairment to a question of why children with autism do not play using spontaneous symbolic play, whether it can be generalised and under which conditions play can be elicited.

Social Play and Pretence : findings of the present project and similar studies

Hobson (1993; 2002) has argued that the child's basis for understanding other people as other people, is their experience of early reciprocal relations with others. In these affectively driven interactions, the child realises that others have a different

perception of the world to their own. Through affective social-referencing, the child comes to understand that others have similar or dissimilar subjective orientations to the world. Through this appreciation of perspective the child develops the ability to hold different views and this leads to the ability to symbolise. Children with autism are impaired in their spontaneous symbolic play because they lack the symbolic ability that would have been developed through reciprocal interactions with affectively engaged others from birth.

Rogers and Pennington (1991) proposed a model that was also derived from studies of early social development. It was suggested that self-other representations were impaired in children with autism and this resulted in impaired imitation, leading to the range of behaviours that are characteristic of children with autism. They also believed that there was a metarepresentational impairment in children with autism. They argued that children with autism having imitation deficits would lack the knowledge of the social world and the perspective of others within it to enable them to use it in play.

The social hypotheses of Hobson and Rogers and Pennington provide an interesting model to examine the results of the present project. Studies 1 and 2 used affectively charged interventions that did use peer and adult imitation. However the children's rapidity in using symbolic play including some spontaneous pretence is not consistent with the model proposed by these authors. The results of Study 3 showed that all the children were able to produce symbolic acts within highly structured and highly affective settings. They did not have to learn about perspective taking or self-other relations within this study in order to symbolise. However it may be possible to argue

that the children were enabled to symbolise in all the high intervention conditions (and not in the low intervention conditions) because the social setting provided a “missing component” or social scaffolding that was necessary to allow the children to symbolise within play. This argument might support the notion that this type of intervention could be used in educational programmes for children with autism but it does not support a social competence deficit model of autism.

In addition, Study 4 showed that the frequency of social and communicative behaviours of children with autism were increased in high structure and high affect interventions. These results, like those of Study 3, are incompatible with the social deficit model, as these models would have predicted that the participants would have had much greater difficulty in using smiles and laughter towards or in response to the researcher as this would have required a facility with affective expressions that is normally absent or less frequently seen in these children.

In sum, Rogers and Pennington’s model would not have predicted the frequency of symbolic acts or affective responses in the high affect conditions of Studies 3 and 4. The social competence accounts of autism are therefore at odds with the results of this study, as they would predict that children with autism should not use symbolic play in the way that was evident here.

In the study by Wolfberg and Schuler (1993), it was found that the results for social play including situations in which both participants focus on the materials at the same time, were positive and all participants spent more time engaged with someone else than they had in the Baseline observations. However, in Probe I, adult attention was

removed and the scores decreased substantially for all participants, when compared with Intervention I.

Although the Probe II common focus results for (one of the participants), Craig may have been skewed for methodological reasons, one of the assessments showed social play at levels comparable with the Intervention phase. Additional qualitative detail also indicated significant social play. It is possible that Craig's success in Probe II was due to his greater social capabilities prior to the intervention.

In Study 1 of the present project, one of the subjects, Oliver, (who had language levels which were approximately the same as Craig) showed similar substantial progress in social play with other children. Prior to the intervention, Oliver had shown little interest in other children and although he was not averse to them, his typical interaction consisted largely of ignoring them or fighting with them to retrieve objects that he liked. In Phase I, Oliver was recorded in solitary play for 5 minutes. In Phase II, Oliver had started to play with another child for 200 seconds. In Phase III, Oliver was observed engaged in collaborative play for 15.5 minutes. Whilst making direct comparisons between these studies is difficult, it is clear that both Oliver and Craig made substantial progress in playing with others.

In Study 2, the same progression was not shown, however some interesting examples of social play were reported. One of the participants, I1 did not engage in play easily with others at any time during either condition, although he would play alongside others. Participant I2 was interested in watching the play of the other participants but did not actively engage in play with them. Participant I3 was somewhat aloof in social

situations but did play alongside others. Participant I4 was also usually aloof and detached from others, but in some play situations he became able to begin to collaborate with other children. In the example given in Study 2, Participant I4 briefly involved another child in his play about making soup. Prior to the intervention, Participant I6 was relatively social and would approach some children and adults (typically to ask repetitive questions about his interest in boats). Participant I5 would approach other children in a bizarre manner, sometimes causing distress to the other participants. In a final example, Participants I5 and I6 collaborated in a complex shared fantasy that lasted 25 minutes of almost continuous play.

In the study by Thomas and Smith (2004), described in an earlier section, the play of 3 subjects was evaluated using a tabletop intervention that involved each child being shown a simple play script. If the participant responded by engaging with the play materials, then the actions of the child were imitated by the adult. Observations were made using video analysis of free-play in the normal social setting.

Social play included tickling and lap games with peers. No social play was recorded prior to the intervention. Only one participant was shown to engage in any social play after the intervention. Participant A displayed social play for 20% of the 10 minute observation period. However Participant B was found to have joint attention for 35% and initiated play for 8% of the post-intervention observation period, but his behaviour was not coded for social play. No definitions were given for terms “joint attention” or “joint attention play” or for “initiating play”. This lack of transparency, clouds the issue of why Participant B used social behaviour but this was not coded as social play. Thomas and Smith state that all participants made gains in social

behaviour. These were coded as tolerating others, joint attention and initiating play. This may have included functional play in which other children were in close proximity, but the target children did not engage with them beyond brief exchanges such as eye contact or giving a toy to another child. These behaviours would not have scored on the play observations as these were measured as the proportion of time engaged in particular types of play.

It is not easy to make direct comparisons between this study and Studies 1 - 4. Only studies 1 and 2 made free-play observations of the participants in a naturalistic social setting. No language levels were given for the participants in Thomas and Smith's study, however Participant B was described as being "... *verbal, (he) played alongside others and was beginning to engage with them in some functional play*" p. 198. (The parentheses were added by this author). Participant B would have some abilities in common with Oliver in Study 1 and would exceed the pre-intervention play skills of Participant I3 and Participant I4 in Study 2. In the examples of Oliver and Participant I4 described above, it is clear that these participants engaged with others in a way that was not shown by Participant B.

Sociodramatic play is defined by Thorp, Stahmer and Schreibman (1995) in their previously described study, as an "*advanced form of symbolic play in which groups of children carry out cooperative dramatizations centred about a familiar theme*" p. 266 which includes role playing, social interaction and verbal communication as three of its five elements. In sociodramatic play, it might be expected that the high focus on social engagement in play would produce many examples of children playing together. Thorp, Stahmer and Schreibman studied three subjects with autism, in which

each child only interacted with an adult researcher and not with any other children. Despite this, all three participants made good progress in the proportion of time engaged with the researcher in role play, spontaneous speech and in positive social behaviour.

There are difficulties in making direct comparisons with the results of Thorp, Stahmer and Schreibman's study due to the lack of social play with peers. The only children in Studies 1 and 2 that had language levels comparable with Thorp, Stahmer and Schreibman's participants were Participants I5 and I6 from Study 2. In an example from Study 2, these participants played together for 16 minutes with three breaks of up to 80 seconds. They made a battlefield with biro pens, plasticine shells and plasticine sandbag bunkers. The battle commenced with an exchange of shells and ended when I6 introduced an enormous plasticine horseshoe magnet which was used to deprive I5 of any weapons.

In Study 4, it was found that children with autism responded positively to adult intervention and showed higher levels of spontaneous speech when the adult put in structural supports for the participants. When this was removed in the low intervention condition, the children with autism did not maintain their high levels of response. In the study by Thorp, Stahmer and Schreibman, subjects were more able to maintain high levels of positive social behaviour, spontaneous speech and role play in the Post-training and Follow-up observations. However the authors did acknowledge that all the participants had difficulties generalising to different settings and to playing with their parents. Interestingly, Thorp, Stahmer and Schreibman describe the difficulties of one of the subjects as possibly due to the severity of his autism,

“ ... he was very often stereotyped in his play and preferred play themes that involved minimal interaction”. p. 279. In reflecting on the play of all the subjects, Thorp, Stahmer and Schreibman state that the,

“... results suggest that children with autism can learn to engage in sociodramatic play, but that their play may remain qualitatively different from children with other developmental disabilities depending on the severity of the disorder” p. 279.

Whilst the results of Studies 1 and 2 demonstrated that the play of some of the participants was not as complex and sophisticated as others, this was attributed to the language abilities of each subject. Four subjects, Richard and Buck (Study 1) and Participants I1 and I3 (Study 2) did have an aloof manner, used more repetitive, echolalic speech, relied on routines and insisted on sameness more than other subjects in these studies. However, these subjects generally had lower language levels than other participants and so the relationship may not be as clear as Thorp, Stahmer and Schreibman suggest. Furthermore, the play of Oliver and Tony (a child with learning difficulties) (Study 1) and Participants I5 and I6 (Study 2) did not show a marked qualitative difference from that of typically developing children with the same language levels.

Spontaneous Play : insights from the present project

Harris (1993; 2000) offers an alternative account of the central deficits in autism and these are of particular relevance to pretend play. Harris (2000) explained that the difficulties that children with autism find in pretence are concerned with the inhibition

of a response resulting from the default reality settings. This impairs the child's ability to construct a situational model, a cognitive capacity that underlies pretence.

“... children project themselves into such imaginary situations, adopting a particular identity and perspective.” p.186

Typically developing children can continuously update this situational model with reference to the physical and social world. Children can then construct a simulation of the episode that enables them to make plans and predictions based on the situational model. Using this, typically developing children cannot only understand the pretence of others but can make their own relevant contribution to it. Children with autism are impaired in their ability to disengage with the salient or prepotent properties of the objects and so do not establish the situational model that would allow them to engage with others about their play easily. Instead children with autism are more likely to spend long periods of time preoccupied with the properties of the objects around them. For some this will be the functional properties of the objects. For others, the physical properties of the objects would be too powerful for the child to shift their attention to a less salient source (Bogdashina 2003). The simulation accounts would expect children with autism to find difficulty in planning ahead to construct narratives and would therefore tend to remain at a familiar point and engage in repetitive play. They might also be expected to have difficulties in maintaining a concept of what the play is about and maintaining new acts of pretence in line with previous ones. In this case, structure might be effective in providing a framework of small steps. Each of these may be attainable for the child rather than them having to construct a large scale plan from the beginning. Would these small steps have assisted the participants in this study to construct a situational model or simulation of the episode ?

In Studies 1 and 2 there was opportunity for the participants to learn about the play episodes due to the repeated pretence format and this could have allowed them to construct simple situational models. However the episodes used in both these studies were always novel to the children, so any situational model must have been a generic one. In Studies 3 and 4 it is less straightforward to support Harris' model. The type of structuring used in the high structure and high affect conditions were not of the type that were used in the earlier studies (Lewis and Boucher 1988; Jarrold et al 1993). Harris' model could partially explain why symbolic play could be prompted in children with autism but not why the participants of studies 1 - 4 were able to use spontaneous symbolic play. Harris' model also cannot fully explain why the participants in Study 3 were able to use symbolic play acts. This would have required an intervention strategy that was able to over-ride the potency of the objects to enable the retrieval of relevant play schemas or representations. In the High Interest condition, participants were able to over-ride the potency of a chosen toy and were still able to demonstrate some symbolic play. This can only be explained if it is accepted that both the high intervention conditions were effective enough to over-ride the salience of the high interest toy.

The participants in Studies 1 - 4 had very little experience of symbolic play and a simulation model seems an insufficient explanation of the findings of these studies. Another variation from the performance hypothesis suggests that children with autism are impaired in the generation of pretence.

It has been predicted that children with autism would be impaired in both functional and symbolic play because of an impaired ability to generate play ideas. However, if these ideas were provided for them using play instructions then the children would demonstrate play acts equivalent to typically developing children. Lewis and Boucher (1995) and Jarrold, Boucher and Smith (1996) provided evidence that children with autism were impaired not in their abilities to retrieve play schemas but in creating the play ideas spontaneously. These predictions were in contrast to the suggestion proposed by Harris (2000) that the children were impaired in their ability to retrieve a schema due to the prepotency of the objects. The ability of children with autism to produce acts of symbolic play using this model is dependent on the child's ability to be externally cued to generate pretence as they lack the internal generative mechanism that is commonly seen in unstructured play settings. In Studies 1 and 2, the children with autism were able to produce acts of pretence as a result of structured intervention but several of these participants went on to engage in spontaneous symbolic play with others. How can this be explained in terms of generativity theory ? It is possible that the child who engaged in spontaneous social pretence was able to do so because their partner in play was able to elicit the generation of imaginative ideas whilst both partners were playing. However on no occasion did the play partner attempt to use formal structures to elicit or instruct their partner into pretence. Rather there was a natural prompt provided by expectation, context and perhaps excitement. These were synonymous with those used in the play of normally developing children between 2 and 4 years old. Similar evidence is reported on studies of children with autism in Integrated Playgroups (Wolfberg 1999; Yang et al 2003). However if this was true then why did these children with autism not engage with others spontaneously in pretence on a day by day basis ? In Study 3, the children were able to produce a good

number of symbolic acts in the high structure and high affect conditions. The generativity model would have predicted that the high structure condition would have been more successful than the high affect. The high interest condition could offer more opportunities to generate play ideas because the child's experience of these familiar and highly motivating toys would provide a larger pool of ideas based on the child's experience with the toys and the video, advertising and peer play that often associates these popular toys. The results showed that although an intervention was necessary to produce pretence in the participants, it was not necessary to prompt the children for ideas. Instead the ideas were forthcoming and appeared to be easily generated within this context.

It is clear that children with autism have difficulties or impairments in producing pretend play and this is particularly so in unstructured settings. The results of this study have posed a challenge to the competence models as children with autism should not be using pretence as easily as they have done in this study if they also have an impairment in producing the symbolic play acts. The performance hypotheses cannot be sidelined as easily and these models may have more to offer this study. However neither the simulation or the generativity models can fully explain the results from this study. That the second researcher was able to produce almost identical results with the participants in Study 3 shows that the results have some reliability, beyond the skills of one person. What would a model that was successful in explaining the results of this study need to have ? Such a model would need to explain why the children with autism were able to play symbolically under prompted and modelled conditions. It would also need to explain why some of the children in Studies 1 and 2 were able to play with other children using spontaneous and novel

pretence. Finally the model would need to explain why the participants were able to produce symbolic play acts under high affect conditions at similar levels to the high structure conditions, why these were reduced in the high interest condition and very much reduced in the low intervention conditions. Any resulting model would need to accommodate the results of previous research findings and should make reference to other work in the field of play in children with autism.

In all settings the children with autism were most successful when they engaged in social play, this may have been with the researcher or with another child. Is there a factor in social engagement that is enabling for children with autism ?

Evidence from Study 2 and Study 1 (Phase III) show that children with autism and learning difficulties were capable of generating novel play acts in free play settings. The examples from the free-play settings have higher levels of spontaneous social and symbolic play than those from highly structured ones. At first glance there might seem to be a contradiction here. Children with autism have difficulties in generating spontaneous acts of symbolic play unless they are in structured settings and yet the participants in Studies 1 and 2 were more spontaneous and creative in their free-play settings. If this is true why then do children with autism not produce spontaneous symbolic play frequently with their peers and siblings or indeed on their own ?

Perhaps children with autism do not recognise that play is pleasurable, possibly because they already find pleasure or at least occupation in the repetitive actions and sensory qualities of toys ? Alternatively, could children with autism be able to play using generative symbols in a somewhat idiosyncratic way, but are very poor at

communicating their actions as play to others and so are not seen as playing and consequently do not learn about it or develop it further as a process ?

Children with autism are poor at communicating their intentions, but children that had been taught about play (whether they be peers or peer-tutors), would be able to interpret the behaviour of others as play, rather than getting confused by it or impatient with it. In Study 1 there were many occasions that the children were not able to communicate what they were thinking whilst they moved the play props. Only through detailed video analysis was it possible to identify the narrative behind what were otherwise intentional but incoherent actions. In Study 2, a boy with severe autism was seen to be behaving strangely. It was not until days later that his teacher realised that he was enacting a sequence from a Tarzan film. The children in these studies were largely unconcerned whether other people were able to watch or be entertained by their pretence. This did not mean that they were not using pretence and generating extended creative narratives using varied types of symbolic play. In an example from Study 2, two children with autism engaged in a long play session, which involved great excitement and a constant stream of imaginative and flexible narratives. This may have happened because both children were excited by the same subject (HMS Titanic) and this provided a shared understanding of each other's actions and mental states. Thus their play behaviour was interpreted through an expectation of Titanic based play behaviour.

The question of whether the production of spontaneous pretence in free-play settings is due to cognitive or conative difficulties is a complex one. Study 3 showed that the children were able to produce pretence in high affect and high structure conditions.

Study 4 showed that the children were more likely to show expressions of pleasure, eye contact and to communicate their feelings in the high affect condition. Being able to communicate about play is an important skill in playing with others and in allowing others to identify the behaviour as play. One of the defining criteria for play (Garvey 1977) is that it should be pleasurable, enjoyable, spontaneous and voluntary. Study 4 supports a conative position. However it seems also probable that priming the children with some highly structured play would give them the tools to play if they should wish. Studies 1 - 4 give some support to the notion that there is value in a play intervention designed to develop spontaneous symbolic play, focusing on both play skills and pleasure.

There is substantial evidence to show that children with autism are able to produce acts of symbolic play in structured settings and some that suggests that children with autism can learn to be spontaneous or social engaging in their play ? Do children with autism generalise this play to other settings and other play partners ?

Generalisation

Much of the research into the use of structure to elicit symbolic play in children with autism has involved short-term studies that have not gathered further data from follow up studies. Wolfberg (1999) is a notable exception to this and she was able to show long-term maintenance and development of play skills in social settings, (although the quantity of symbolic play was not high). However Wolfberg's study used peer-tutoring to teach children with autism how to play. This is very different from the quasi-experimental research in this thesis that successfully elicited symbolic play. Evidence from pivotal response training in play with relatively able young people

with autism showed success in using symbolic play and this was maintained throughout the intervention. This lends support to the idea that children with autism can maintain the gains that can be seen in some studies providing the structure remains in place. Wolfberg's studies have shown that there is generalisation into different settings and progression in play types and it seems probable that children with autism would be able to continue to engage in social play providing suitable respondents were available.

Some evidence from Study 1 supports these findings from the literature. In Phase III of Study I, participants were given no guidance, but suitable materials for play were made freely available for the designated time. Although this phase did not offer opportunities to generalise play skills to other settings or with other children, it did show that the participants were able to generate play without external structuring of the play experience and use unspecified, non-routine or new materials within their play. The lack of opportunities to further generalise play skills in the design of these studies was a weakness of the research design. The studies would have also been improved by a longer baseline period to better assess the pre-intervention skills of the participants of Studies 1 and 2.

Practical Issues

The results from Study 3 showed that the number of symbolic acts produced was similar in the high affect and the high structure conditions. Why would high affect assist children with autism to use symbolic play skills at a similar level to the high structure condition ? In attempting to answer this question it is necessary to examine aspects of two more complex questions. What is it in the structuring of pretence that

enables children with autism to use play acts and to play ? Is this shared by aspects of the high affect condition in Study 3 and in the relatively behavioural approaches used in pivotal response training (Thorp, Stahmer and Schreibman 1995; Thomas and Smith 2003) and in the peer-tutoring (Wolfberg 1999) approach ? Is there something about the nature of autism that is responsive to this aspect of intervention ?

The term “structure” is often used synonymously with approaches such as TEACCH (Treatment and Education of Autistic and related Communication handicapped CHildren), pivotal response training and Applied Behavioural Analysis. It may be that this type of structure provides very clear instructions or guidance to the child with autism. These instructions are provided in a medium that is most easily understood by the child. For some children this might involve visual symbol cards or photographs. For others it might involve clear and unambiguous speech. For others it might involve the use of objects as referents or physical rehearsal of actions through back chaining. In the study by Lewis and Boucher (1988), structure was used to mean either a direct question to the child such as “can you do something else with these ?” or by demonstrating an action with the objects and then giving them back to the child. In pivotal response training the structure might consist of providing new play materials when the child had used the previous ones in an appropriate way. Is it possible to identify what is common to these uses of structure and suggest why this might be useful in teaching children with autism ?

Although there is an increasing literature on the subject of play in children with autism from the academic, research and practical perspectives, there is little published on why a particular intervention might be working. There is wide agreement that

structured approaches are generally useful as a teaching technique in autism and some agreement that structure is also useful in teaching play skills. Despite this there is little to suggest why structure is useful specifically in pretence and what types of structure might be most effective. This may be likened to agreeing that it is useful to give someone a roadmap on a long and complex journey, without any consideration of their previous experience of similar routes, or their navigational, literacy or driving skills. What will be ideal for one driver may be confusing to another. Furthermore, it may be possible to teach a child to make progress in pretence by acquiring more symbolic acts within a given context without them recognising or feeling (Damasio 2003) why it is worth doing. To play for external reasons or reinforcement is not to play but to perform. It may still have a value, but it may not provide a different, imaginative, aliteral mode of thinking (which may be of great value to children with autism). In order to explore these questions further, a broad overview of why different theoretical and practical approaches might use structure is suggested.

The Role of Structure

Perhaps there is something enabling within social engagement that can facilitate the type of play behaviours that are not normally seen in children with autism. Several researchers have found difficulty in eliciting pretend play in children with autism. There is also the case that if it were easy to tune into the play of a child with autism, then siblings and peers would be able to play with them in a way that is rarely seen in reality. However, Wolfberg (1999) showed that if the normally developing child has been trained and is guided in playing with the child who has autism, steady progress can be made. This gives support to the position that Hobson (2002) took in the value of intersubjective engagement or connectedness. Through this connectedness it is

possible that children with autism are able to build a shared understanding of the world and a shared construction through imagination and pretence. It was not possible to support this position using the results from Study 3, as the number of symbolic play acts produced were similar in both the high structure and high affect conditions. Study 2 also showed that the participants were successful in eliciting symbolic play following both the high affect and high structure interventions.

It is also possible to examine these issues in a different way. Rather than considering high structure as a form of social engagement that is enabling in the elicitation of symbolic play, it is possible to consider high structure as a form of social structuring.

This idea of breaking the task down into small steps by using structure is common to many approaches and theoretical models. Behavioural approaches would see the task of pretence as requiring an approach that builds up play sequences through structuring and then generalising out to unfamiliar scripts. Although the visual structuring that has been propounded by TEACCH has not been fully explored, aspects of it have been applied to play by Sherratt and Peter (2002) and more explicitly by Beyer and Gammeltoft (2000). Yet both these publications advocate that play should be shared with others and that this process should be fun and exciting for children with autism. Thus even in behavioural approaches, affective techniques may be employed and may or may not be fully acknowledged. An intersubjective position might consider the structured approaches to offer rational bridges to compensate for, or alternatively to offer intersubjective learning opportunities to develop the underlying deficit in social and symbolic play.

These approaches do not always match with their philosophical origins. In practice they may introduce highly affective components without crediting the influence that this might have in providing positive results. Instead the success may be easily attributed to the abstracted philosophical and pedagogic position that the approach is thought to hold. It may then be possible for highly behavioural approaches to use highly animated, affective strategies to engage a child with autism in play. It may also be possible that approaches that advocate highly animated, affective strategies (e.g. Options Institute) may be offering the child a structure that enables them to socially engage by breaking through the “generativity barrier” and allowing intentions to be clearly communicated. The generativity barrier can be considered the arousal level that is necessary for the mind to create a novel representation or narrative. It may be that, events that raise arousal levels in play might have this effect.

Can high affect be considered as a form of social structuring that might arouse a child to generate novel representations ? In a structured task, the steps towards the ultimate goal or process are made clear and are sequenced so that the child is led using a communicative medium that can be followed towards achievable sub-goals. Does play that uses high affect meet these same criteria ?

In the high affect condition of Study 3, the researcher followed the actions and eye-gaze of the child. The researcher commented in a positive and enthusiastic tone on the child’s actions. The researcher attempted to engender a sense of shared interest in the play materials and encouraged the child to take a keen interest in the play possibilities of the materials. When the child created something observable, the researcher attempted to raise the arousal levels of the child by sensitively turning up the affective

levels and attempted to create a shared sense of pleasure or excitement with the child. The researcher had a clear goal or process in mind and used expressions of interest and excitement as the communicative medium. Rather than leading the child towards the sub-goals of symbolic acts within the play, the researcher allowed the child to explore their own way, but shared the way with them. Garvey (1977) states that play should be spontaneous and does not have any external goals imposed on it and so this type of facilitation of high affect play would be more closely aligned to the conditions for spontaneous play. Thus the high affect condition has similarities with the high structure condition. The high structure condition encouraged the child using an initial script and low affect, content-free, temporal prompts towards an imaginative narrative. In the high affect condition the researcher followed the child and marked this by sharing the child's interest in an object or construction. In both conditions, the researcher shared mental space with the child whilst a shared construction was formed around a shared process. In the former, the mental space was a rational, linguistic one. In the later case, the shared mental space leaned towards an emotional appreciation of the experience. Perhaps both structure and affect were used to make small cognitive and conative connections with the subjects and this process of engagement about the play materials made the intense play interventions of Studies 1 and 2 and the high intervention conditions of Study 3 successful.

To draw this discussion towards a close, it has been shown that the participants in Studies 1 to 3 were able to produce symbolic play and some of this appeared to be novel and spontaneous. All the participants engaged with others and this may have been accentuated by the use of affect as a component of the intervention. It was suggested that both structure and affect had a structuring effect that was seen under

the high intervention conditions of Studies 3 and 4 and under the more naturalistic teaching conditions of Studies 1 and 2. The elicitation of symbolic play under this high intervention condition was seen in these very different settings and with two researchers, but not under the low intervention conditions of Study 3.

Two key questions come out of this discussion. These are important areas of future research :

- Are different types of narrative structure more effective than others in eliciting symbolic play ? Additionally, is it possible that finding a single “most effective” strategy will be suitable for all children with autism ? Would the level of learning difficulties the age, sex or previous experience of the child be significant in the effectiveness of these structures ? Is it also possible that personality differences, severity of autism or sub-groups within the autism continuum would more significantly effect the results ? These questions may be also important for many other types of intervention that are used with children with autism. These are often thought to be effective with some children but rarely with all. It is possible that there are sub-groups within the autism spectrum that influence the effectiveness of these. However there may be other influences such as personality type that could also be influential. These factors apply equally to the next key question for future study, that of social structuring.
- Are different types of social structure more effective than others in eliciting social communication within play ? This study supported the idea that high affect could be also seen as a form of structuring and that the mechanisms

involved were similar to those found in narrative structuring. However instead of structuring to highlight the importance of future choices and opportunities, affect was used to highlight and make relevant the social features of the social experience. In Study 3 and 4 the affect and structure conditions were separated but were administered within very tight parameters. Thus the type of social structuring used demonstrated little variation in the style of administration. Would social structuring using peers instead of adults change the results of engagement through play ? If the adult focused on particular features such as the use of verbal utterances or joint attention would the child be more likely to develop skills associated with this focus ? Does the sensitivity of the adult to the child's attention, interests and behaviour have any effect on the success of the engagement or is it dependent on the structure of the intervention itself ?

Conclusion

This study has considered the literature on the play development of children with autism and normally developing children and has examined the results of four studies that have attempted to question in which ways children with autism can be taught to use symbolic play. All the children in the research used little or no symbolic play prior to the interventions but were able to display this capacity during these studies. In Studies 1 and 2, the children were involved with interventions that extended over several weeks and these children were seen to use symbolic play in spontaneous and creative ways. Sometimes this play was with their peers in unstructured settings and some of the most complex episodes of play were seen under these conditions. In more structured settings, the children were also able to use symbolic play and on occasions there were episodes of spontaneous and creative play. This was not always equally successful but usually elicited some symbolic play amongst most of the participants. In Studies 3 and 4, the children were able to demonstrate symbolic play in a relatively formal and clinical setting. These interventions were short, but some of the children used acts of play that may well have been spontaneous and novel. The results showed that the high affect and the high structure conditions were particularly successful in eliciting pretence in the participants. In contrast, low intervention conditions such as low structure, low affect and low interest did not provide favourable conditions for the elicitation of symbolic play. In Study 4, the children demonstrated high levels of social communicative behaviour in both the high affect and the high structure conditions, but showed a low number of communicative expressions in the low intervention condition. These findings were discussed in light of the literature in the

discussion section and the implications for future research and therapeutic interventions were proposed.

Different models were discussed that might be able to explain these results. Although many of these models did have something to offer this study, none of the models were able to explain all the evidence that came from Studies 1 to 4. Instead the discussion explored different models including the metarepresentational and executive dysfunction accounts of this evidence. The difficulty in exploring the evidence through these models is that the results do not match many previous findings. This disparity between the evidence from this research and that of other researchers could be cause for concern. However that the research for this thesis has been undertaken in several different schools and that this author has conducted research in other schools for children with autism and found similar results has provided support for this study. Furthermore this author has spoken to possibly hundreds of parents and professional educators or therapists who have provided anecdotal evidence to support these findings. There are of course still many questions to answer in this field, but the evidence presented in this study has made a contribution to the knowledge base of autism and symbolic play. This contribution is of value to researchers, academics and to practitioners. Through Studies 1 and 2 in particular, the research has been of immeasurable value to the children who participated in this study. It is to be hoped that other children with autism will benefit from the practice and research that builds upon this in the future.

Through this study, this author has worked at length with many children who have autism and found the interventions developed through this research to have beneficial

effects in enabling the children to meaningfully engage with the world of pretence in a way that was not evident to them before and sometimes to engage with others with a quality of interaction that was normally missing. On several occasions I have found the behaviour of some of these children to look like the behaviour of normally developing children engaged in play. The behaviours that so often define their autism were not in evidence when these children were deeply engaged within pretence. Their language was more spontaneous and creative, their motor control was sometimes more coordinated, their facial expressions were more communicative and the quality of their imaginative ideas was on occasions of a remarkably high quality. In no way did this make these children not have autism, but perhaps gave a glimpse to a way of engaging with the world that was profoundly different to their normal experience. In a similar vein Schuler and Wolfberg also found remarkable qualitative differences in the behaviour of their subjects during play with others.

“... the longer the children with ASD are involved in play groups, the more difficult it becomes to tell them apart from their typical peers. Besides the observed gains in conventional object use, the overall affect of the children involved in play groups seems more typical.”

Schuler and Wolfberg (2000) pp.272.

Through this study, it was found that children with autism were able to engage in pretence that was sometimes spontaneous and often symbolic. When this worked most effectively, the children were engaged with other people. This was clearly evident in examples from Studies 1 and 2. It was also shown in the high and low intervention results from Study 3. In Study 4, the social dimension was examined specifically and

the results showed that the children responded to social interaction in an idiosyncratic but reciprocal way. Throughout this study the importance of providing both purpose to the interaction through structured play and an intersubjective engagement was clear. There are still questions to ask on this subject and some of these were identified in the last chapter. However the evidence from this study indicates that the answers to these questions may well lie in the interface between cognition and emotion and how these relate to memory, perception and planning. The context that the child plays within may well be important and deserves further study. The question of social engagement in play and learning may be the most important of all not only in developing symbolic play but an understanding of autism itself.

This thesis has contributed towards a better understanding of this transactional relationship. As a whole, this thesis involved the first stages of the research process and identified a potential area of future investigation. Such investigations will require more rigorous research designs to definitively tease out the factors that were significant for individuals in this thesis.

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